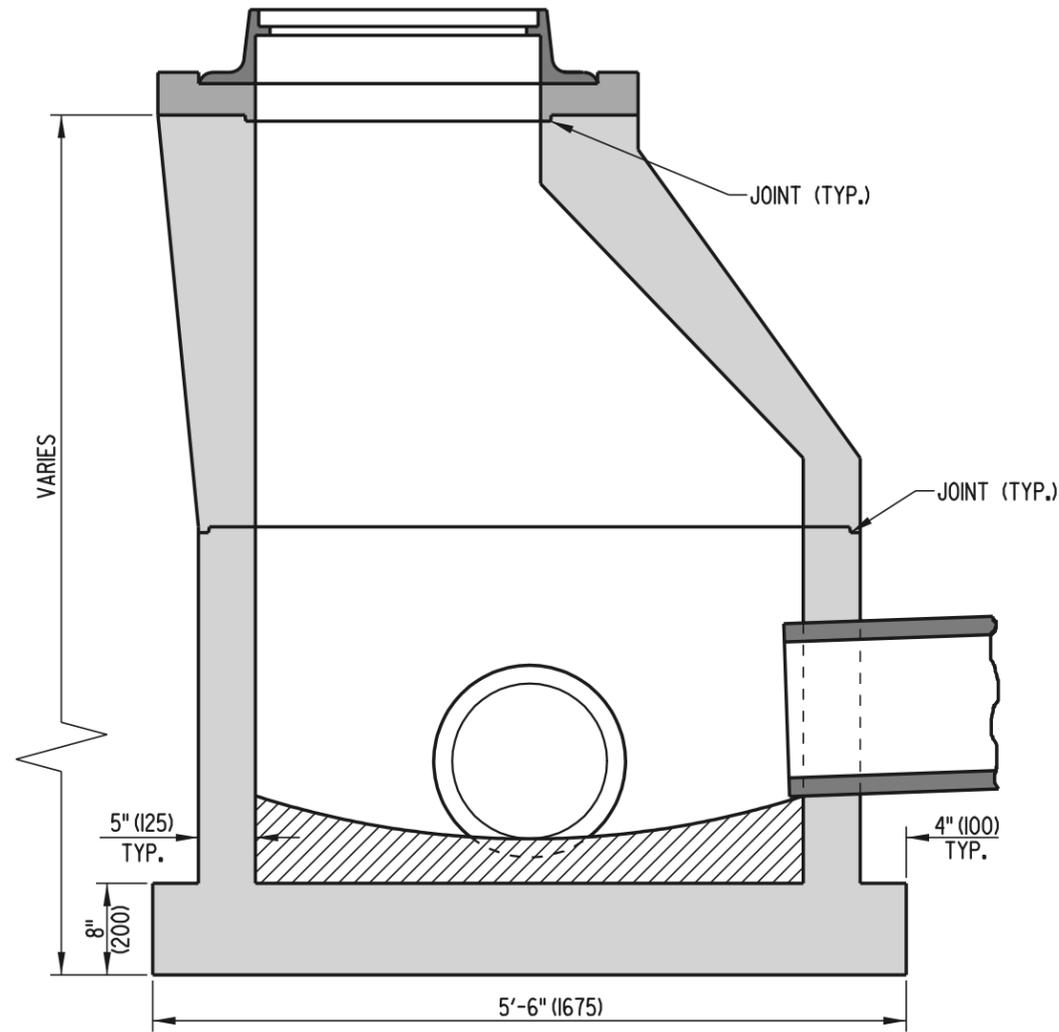


PLAN



SECTION A-A

ROUND MANHOLE ASSEMBLY

NOTE: ROUND MANHOLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH AASHTO M 199.



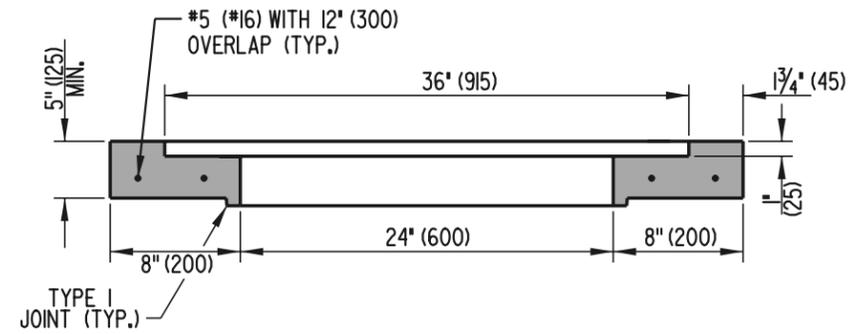
DELAWARE  
DEPARTMENT OF TRANSPORTATION

MANHOLE DETAILS

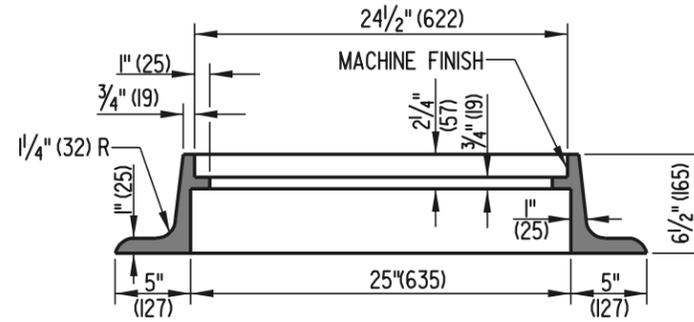
STANDARD NO. D-6 (2001) SHT. 2 OF 4

APPROVED *Ryan M. Harkness* 6/18/01  
CHIEF ENGINEER DATE  
 RECOMMENDED *Mehal Akhavan* 6/18/01  
DESIGN ENGINEER DATE

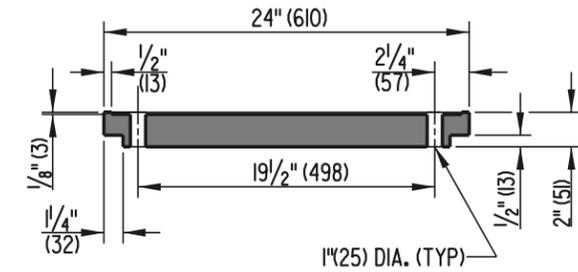
NOTE: TOP UNIT IS TO BE CAST IN PLACE TO GRADE AS SPECIFIED ON PLAN SHEETS OR AS DIRECTED BY ENGINEER.



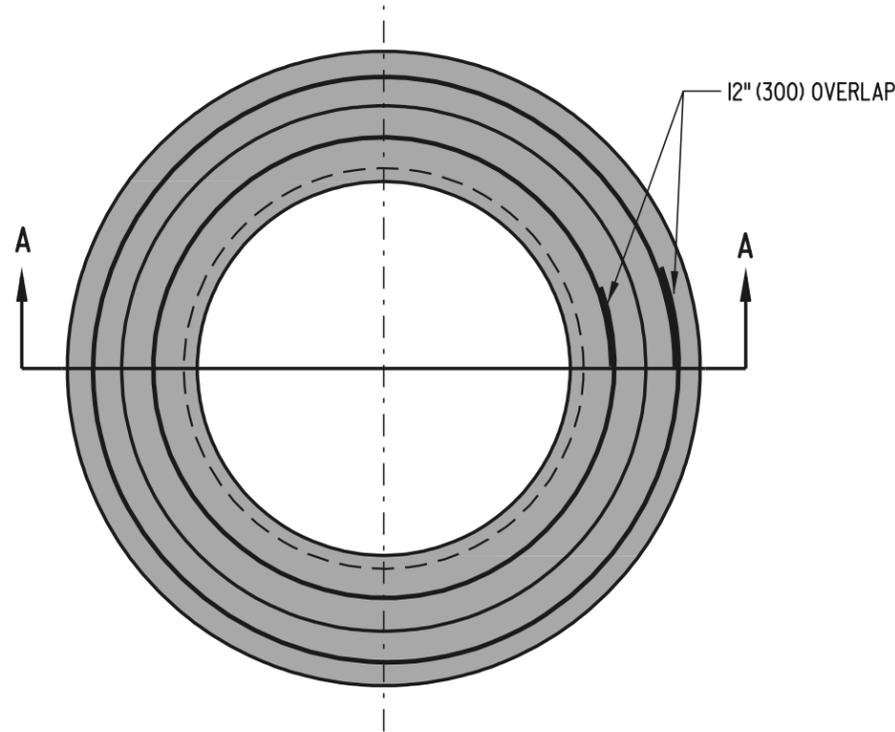
**SECTION A-A**



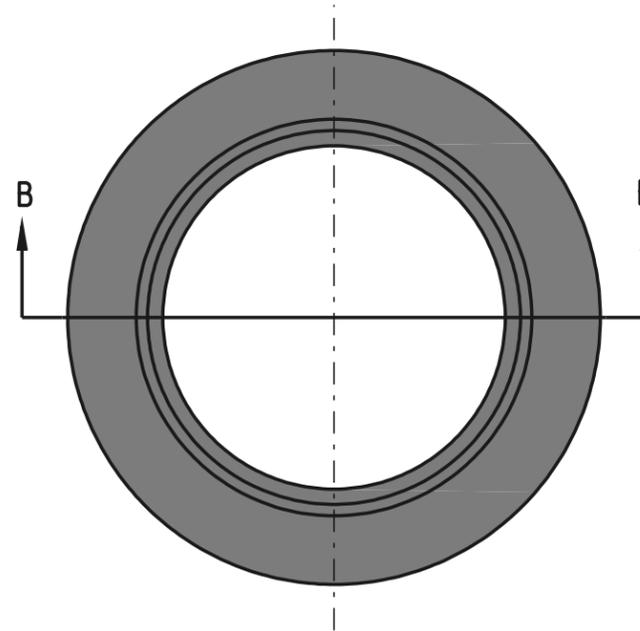
**SECTION B-B**



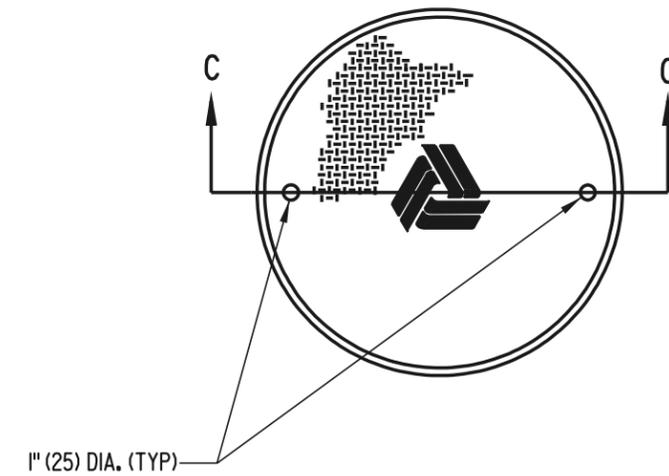
**SECTION C-C**



**TOP UNIT**



**FRAME**



**COVER**



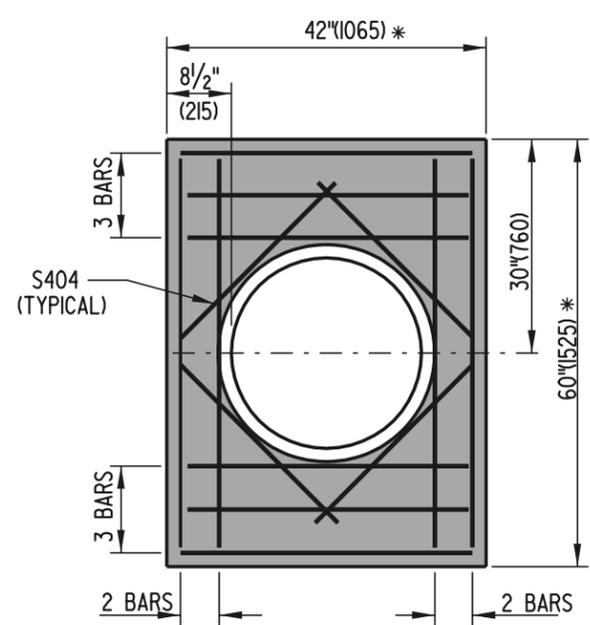
DELAWARE  
DEPARTMENT OF TRANSPORTATION

MANHOLE DETAILS

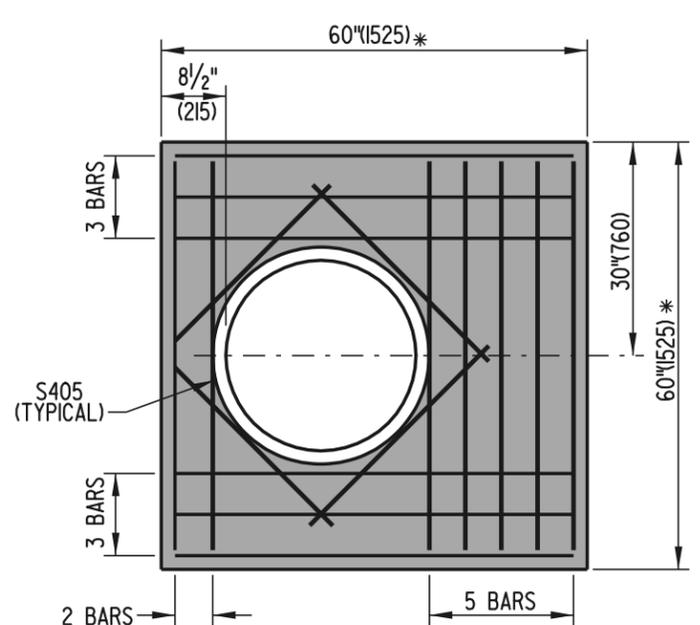
STANDARD NO. D-6 (2001) SHT. 3 OF 4

APPROVED *Ryan M. Harkness* 6/18/01  
CHIEF ENGINEER DATE

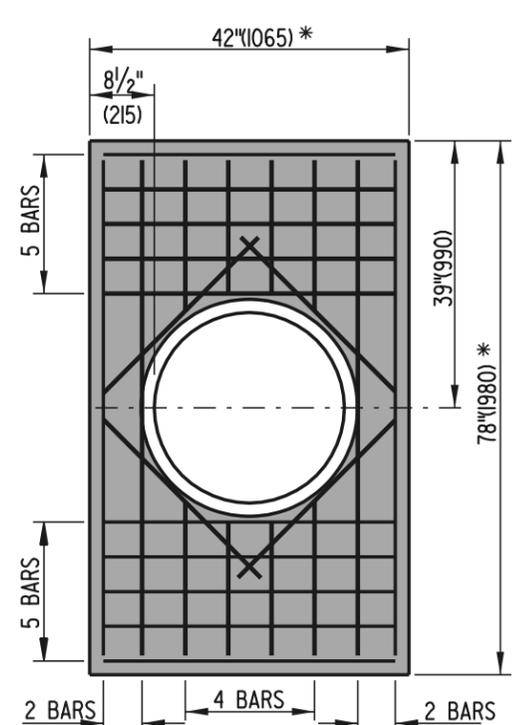
RECOMMENDED *Mehal Alghob* 6/18/01  
DESIGN ENGINEER DATE



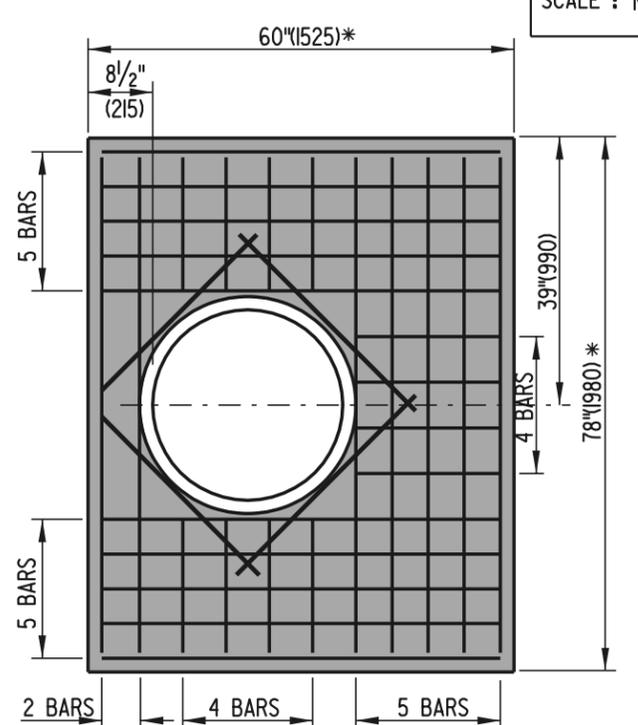
**48" (1220) X 30" (760) MANHOLE**



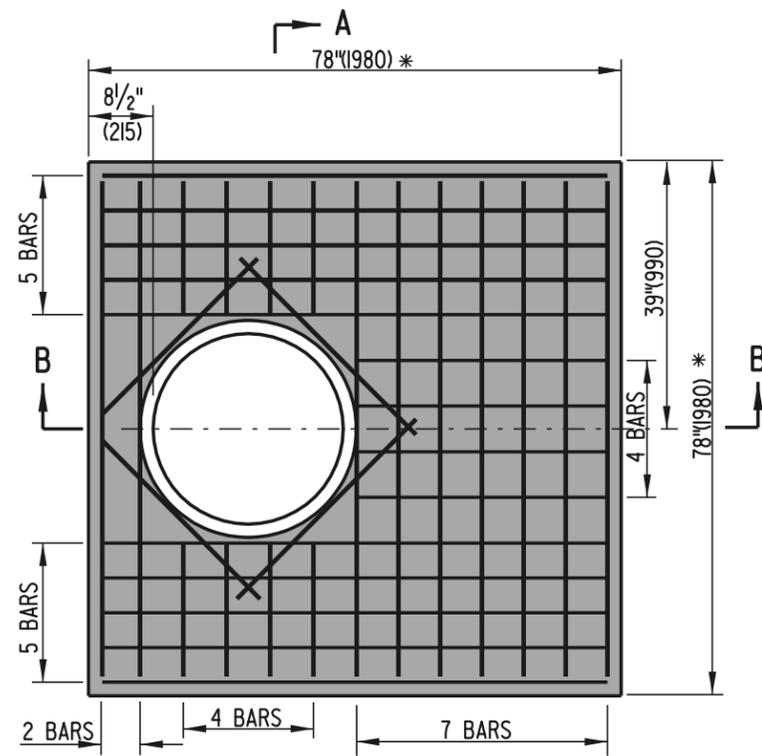
**48" (1220) X 48" (1220) MANHOLE**



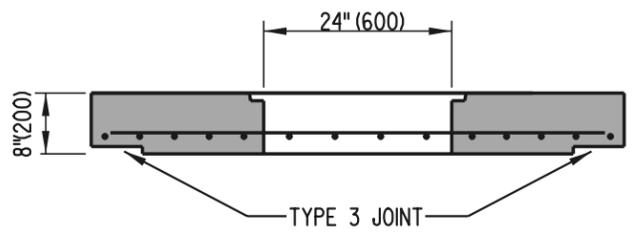
**66" (1675) X 30" (760) MANHOLE**



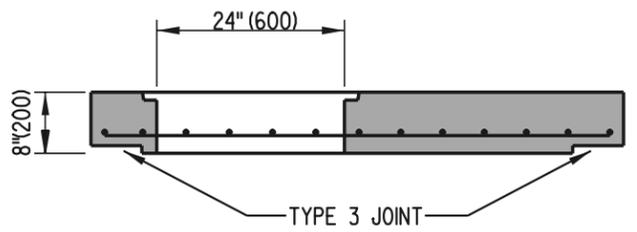
**66" (1675) X 48" (1220) MANHOLE**



**66" (1675) X 66" (1675) MANHOLE**



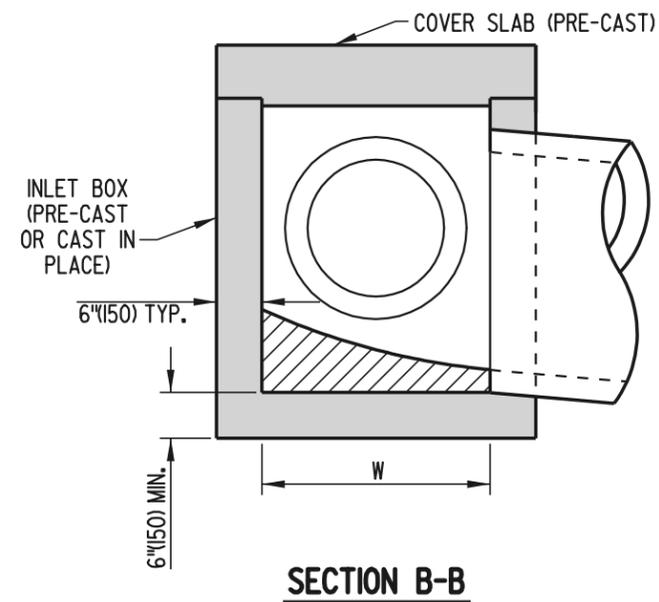
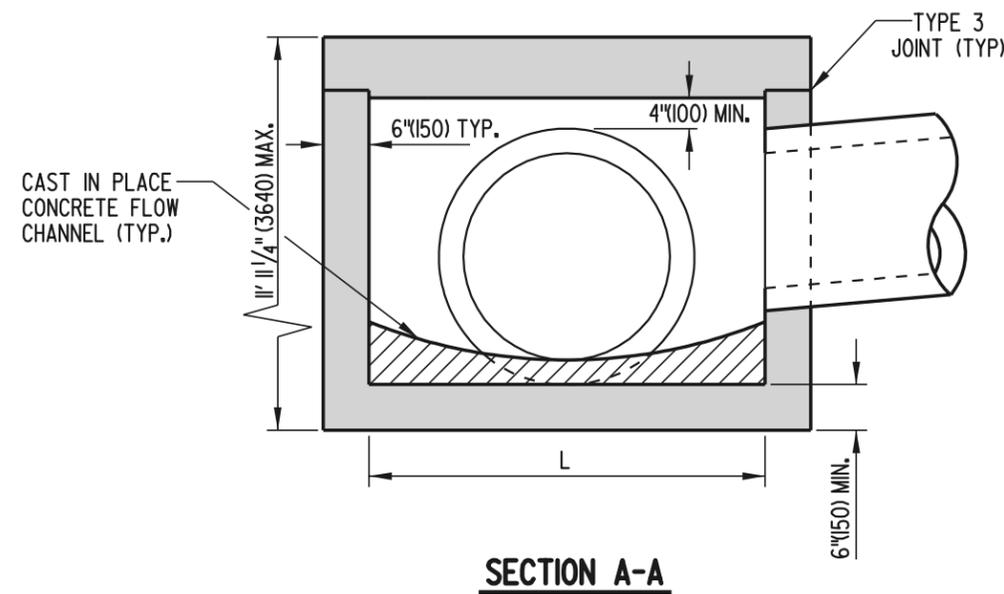
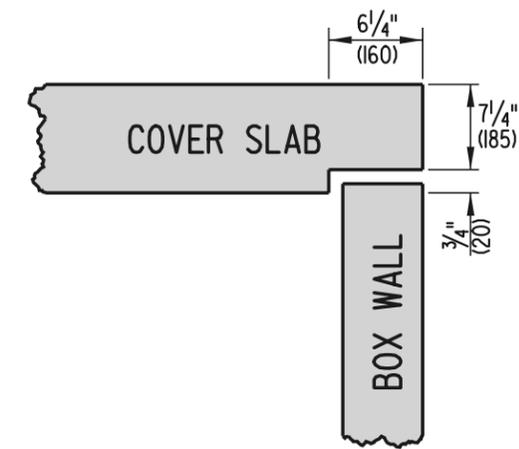
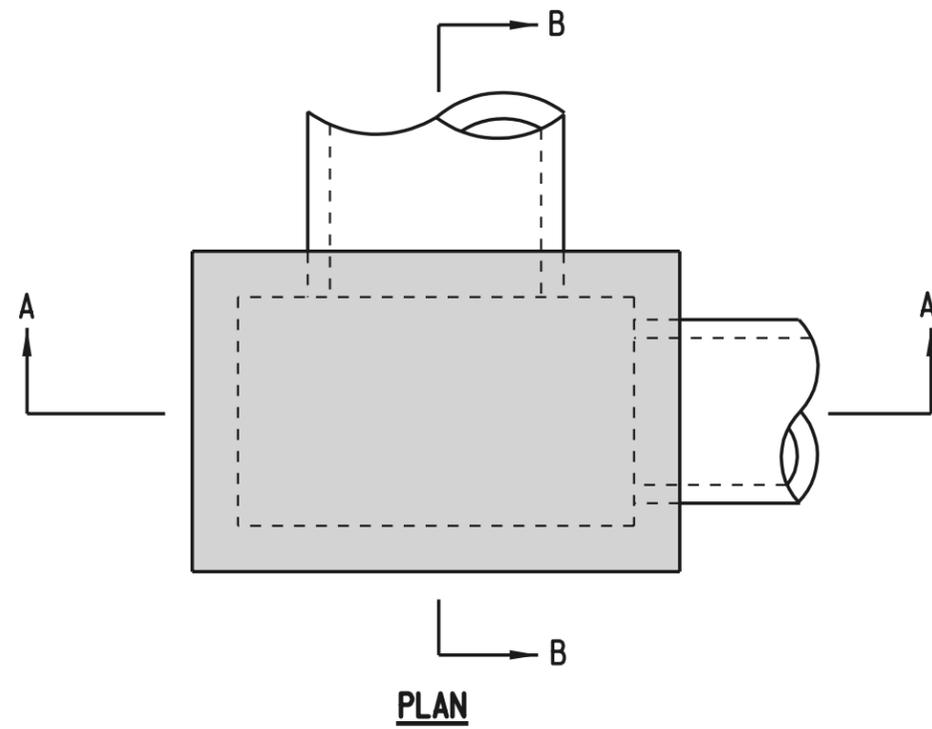
**SECTION A-A**



**SECTION B-B**

**BOX MANHOLE COVER SLAB DETAILS**

- NOTES:**
- COVER SLABS SHALL BE PRE-CAST.
  - ALL BARS SHALL BE #5 (\*16) SPACED AT 6" (150) ± UNLESS NOTED OTHERWISE.
  - MINIMUM BAR COVER = 1/2" (38).
- \* - DIMENSIONS TO MATCH OUTSIDE TO OUTSIDE DIMENSIONS OF BOX.



**JUNCTION BOX ASSEMBLY**



DELAWARE  
DEPARTMENT OF TRANSPORTATION

JUNCTION BOX DETAILS

STANDARD NO.

D-7 (2002)

SHT. 1

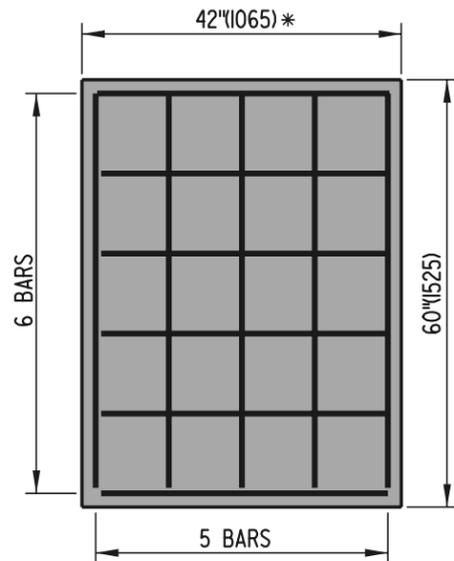
OF 2

APPROVED

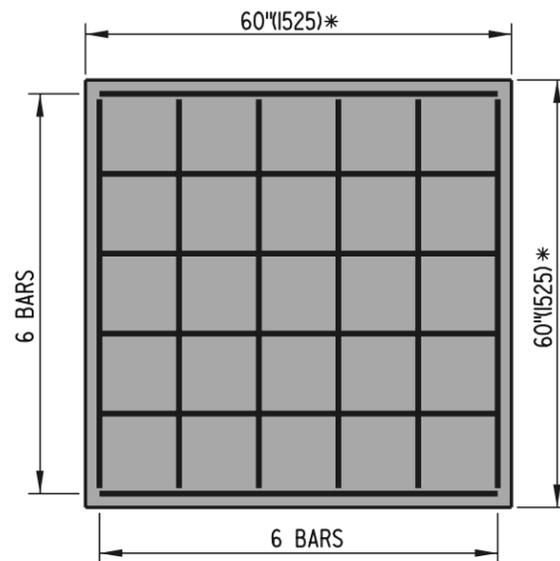
*Caution Wicks* 9/6/02  
CHIEF ENGINEER DATE

RECOMMENDED

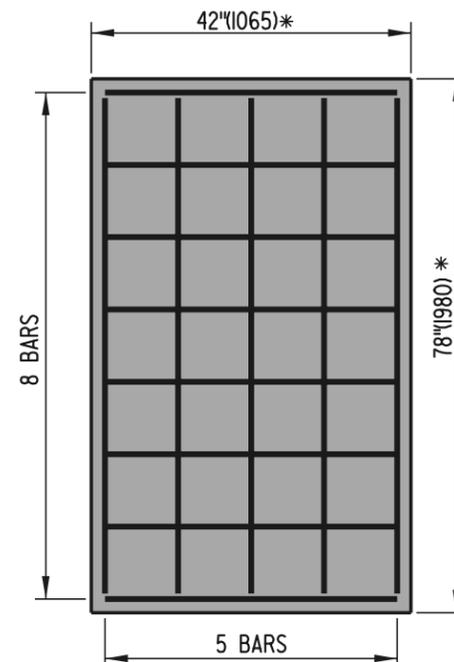
*Theresa Roberts* 8/19/02  
DESIGN ENGINEER DATE



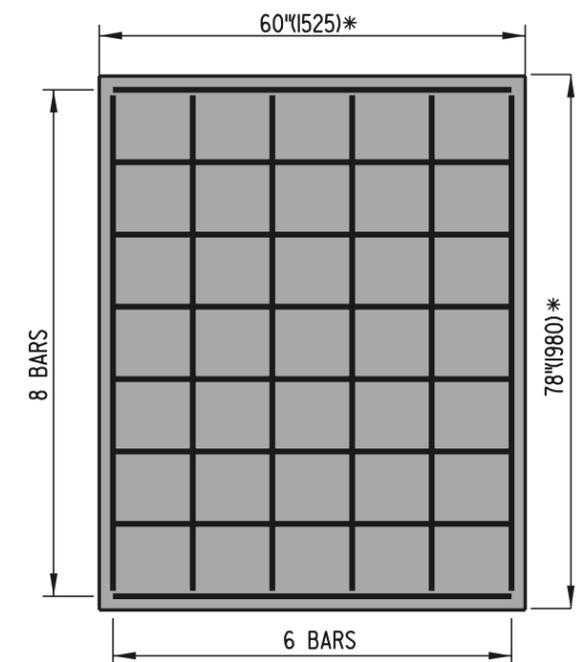
**48" (1220) x 30" (760)  
JUNCTION BOX**



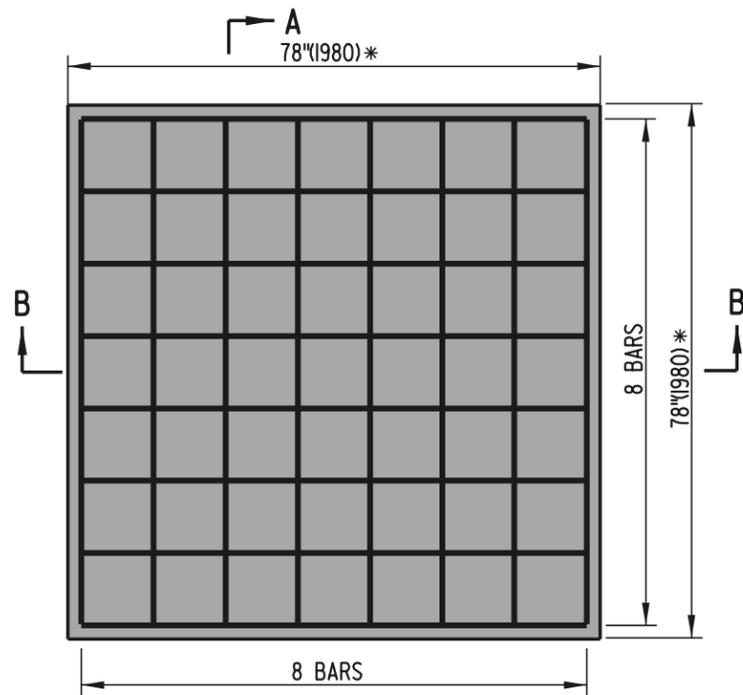
**48" (1220) x 48" (1220)  
JUNCTION BOX**



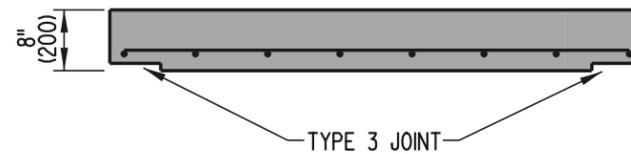
**66" (1675) x 30" (760)  
JUNCTION BOX**



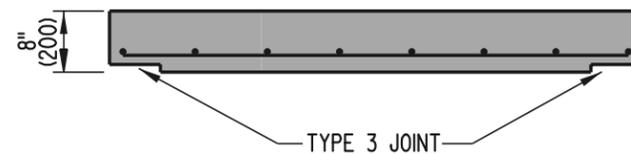
**66" (1675) x 48" (1220)  
JUNCTION BOX**



**66" (1675) x 66" (1675)  
JUNCTION BOX**



**SECTION A-A**



**SECTION B-B**

**JUNCTION BOX COVER SLAB DETAILS**

**NOTES :**

1. COVER SLABS ARE TO BE PRE-CAST.
  2. ALL BARS ARE TO BE #5 (#16) SPACED @ 12" (305) ± UNLESS NOTED OTHERWISE.
  3. MINIMUM BAR COVER = 1/2" (38).
- \* - DIMENSIONS TO MATCH OUTSIDE TO OUTSIDE DIMENSIONS OF BOX

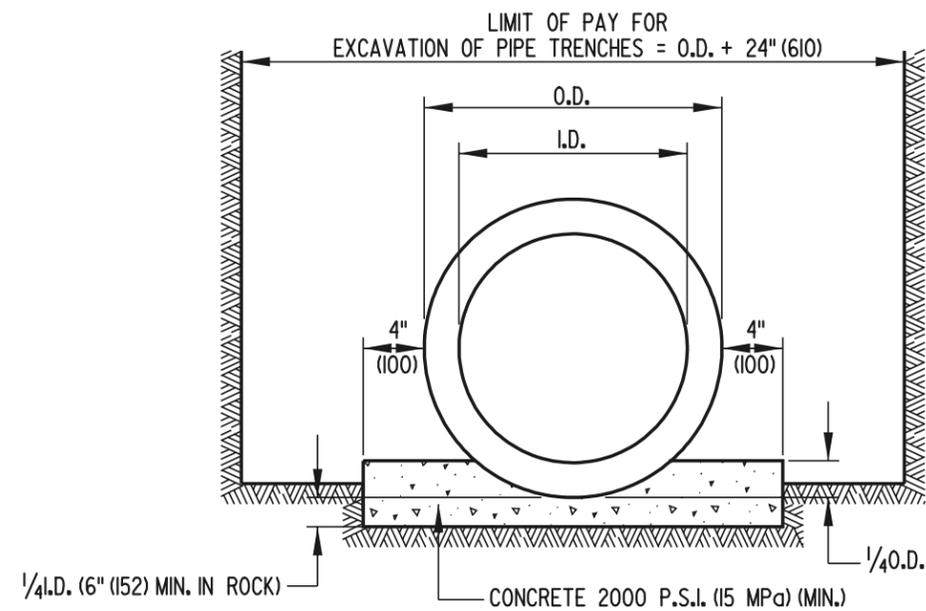


DELAWARE  
DEPARTMENT OF TRANSPORTATION

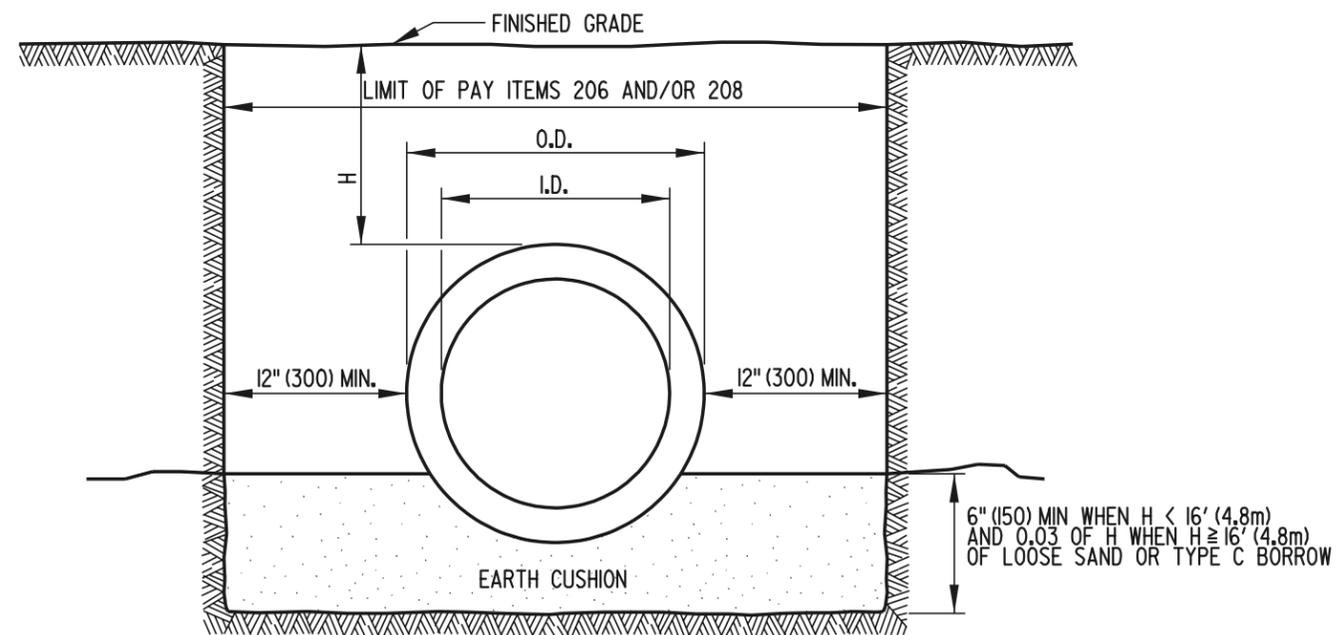
JUNCTION BOX DETAILS

STANDARD NO. D-7 (2002) SHT. 2 OF 2

APPROVED *Caution Wicks* 9/6/02  
CHIEF ENGINEER DATE  
RECOMMENDED *Therese Delgado* 8/19/02  
DESIGN ENGINEER DATE



**CLASS A BEDDING**



**CLASS C BEDDING**

NOTE: USE CLASS C BEDDING UNLESS OTHERWISE INDICATED



DELAWARE  
DEPARTMENT OF TRANSPORTATION

PIPE BEDDING

STANDARD NO.

D-8 (2001)

SHT. 1

OF 1

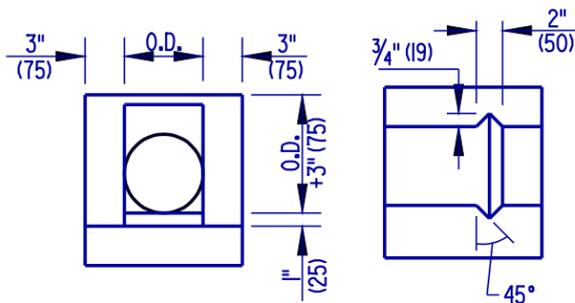
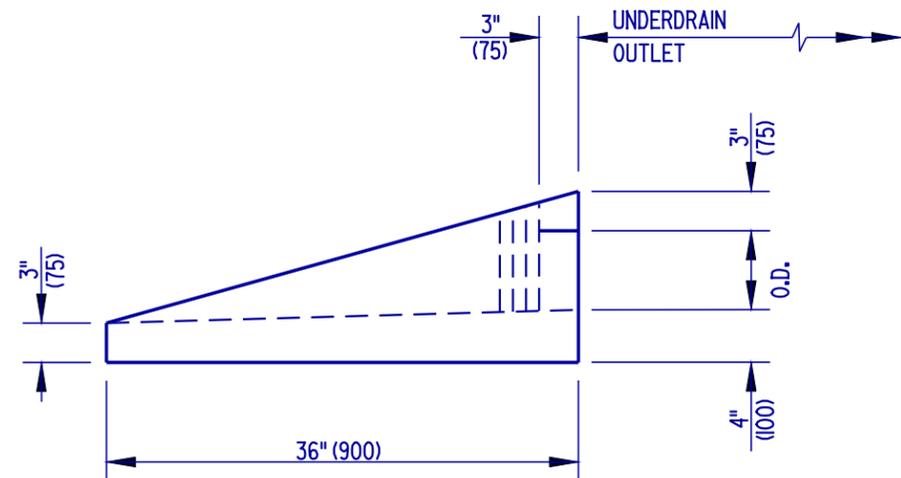
APPROVED

*Ryan M. Harshbarger*  
CHIEF ENGINEER DATE 6/18/01

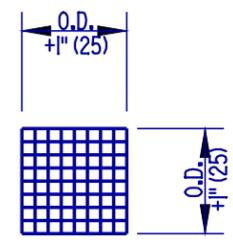
RECOMMENDED

*Michael R. [Signature]*  
DESIGN ENGINEER DATE 6/18/01

SCALE : N.T.S.

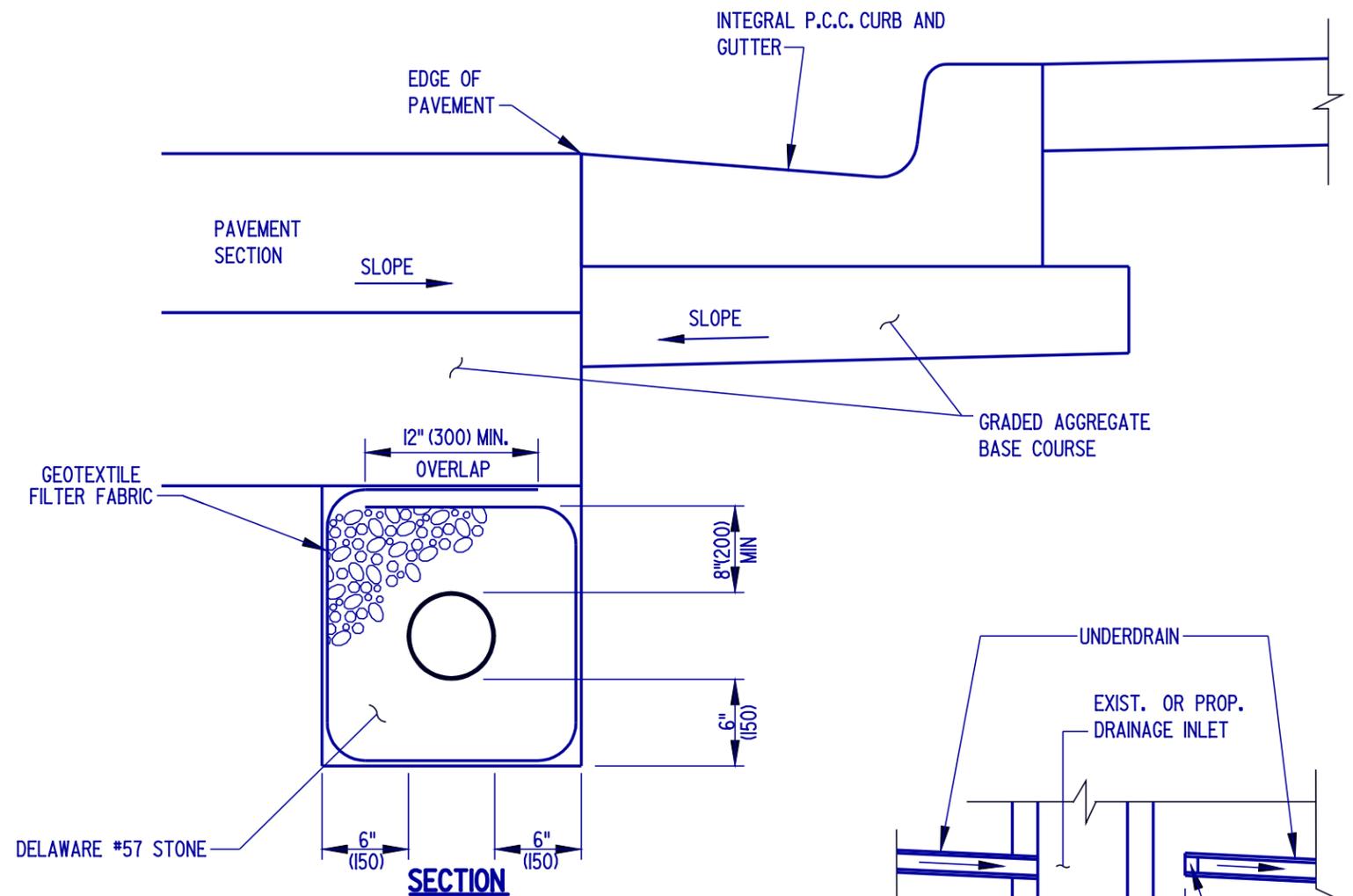


**FRONT VIEW**  
**TOP VIEW**  
**SLOTTED HEADWALL DETAIL**

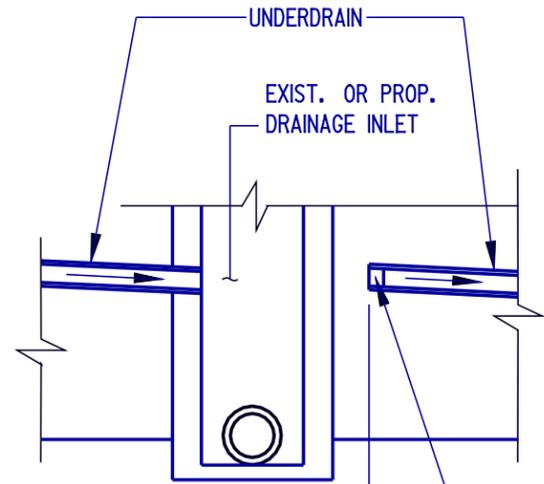


**FRONT VIEW**  
**RODENT SCREEN**

**CONCRETE HEADWALL FOR UNDERDRAIN OUTLET**  
NOT TO SCALE



**SECTION**



**ELEVATION**

**PERFORATED PIPE UNDERDRAIN**  
NOT TO SCALE

- NOTES:**
1. GEOTEXTILE FILTER FABRIC SHALL BE PLACED ENTIRELY OVER THE TOP OF UNDERDRAIN TRENCH AND LAPPED AS SHOWN.
  2. SLOPE OF UNDERDRAINS SHALL MATCH ROADWAY GRADE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
  3. OUTLET PIPE CONFIGURATIONS SHALL USE 45 DEGREE ELBOWS OR SHALL USE STRAIGHT PIPE WITH A MINIMUM RADIUS OF 3' (900) TO DIRECT UNDERDRAIN PIPE INTO SIDE OF DRAINAGE INLET OR TO POSITIVE GRADE. PIPE SHALL ALSO BE NON-PERFORATED AND HAVE A SMOOTH INTERIOR.
  4. RODENT SCREEN SHALL SNUGLY FIT THE PROVIDED SLOT WITH THE SCREEN LIP FITTING TIGHT TO THE BOTTOM FLOW LINE.
  5. A 4' (1200) FLEXIBLE DELINEATOR SHALL BE FURNISHED AND INSTALLED AT THE DIRECTION OF THE ENGINEER TO MARK THE LOCATION OF THE CONCRETE HEADWALL. COST INCIDENTAL TO DOWNSPOUT SPLASH APRONS ITEM.
  6. WHEN TWO LINES OF PIPE UNDERDRAIN DRAIN TO A LOW POINT, EACH PIPE MUST HAVE ITS OWN OUTLET.

PIPE END CAP TO BE INCLUDED IN THE UNIT PRICE BID FOR PERFORATED PIPE UNDERDRAIN ITEM.

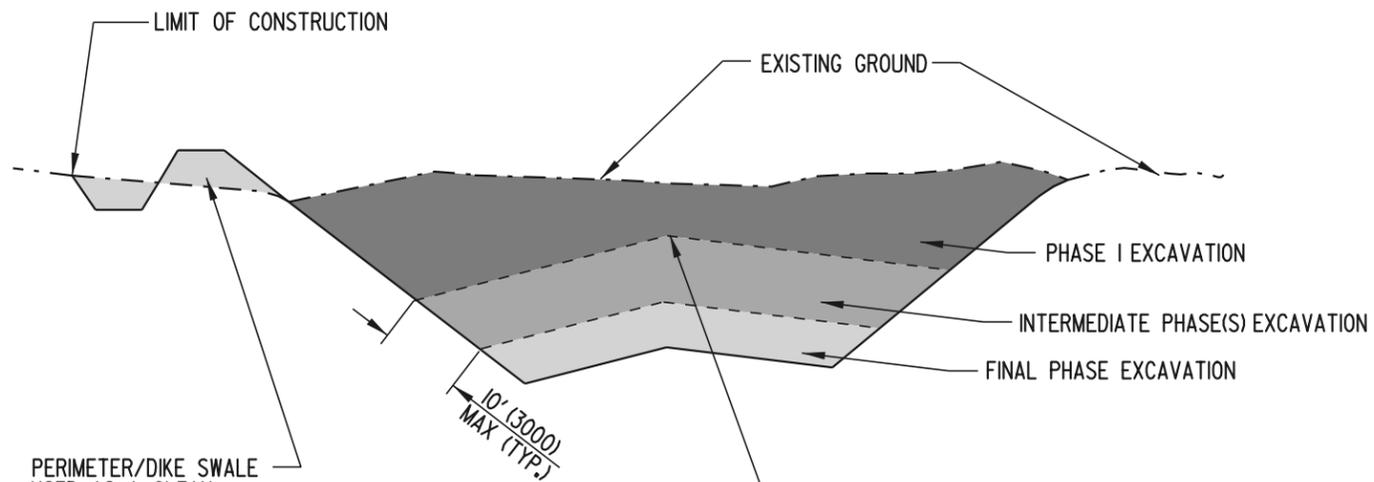


**DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**

**PERFORATED PIPE UNDERDRAIN DETAIL**

STANDARD NO. **D-9 (2004)** SHT. **1** OF **1**

APPROVED *Carolann Wick* 1/10/05  
CHIEF ENGINEER DATE  
RECOMMENDED *Dennis M. O'Flaherty* 1/13/05  
DESIGN ENGINEER DATE

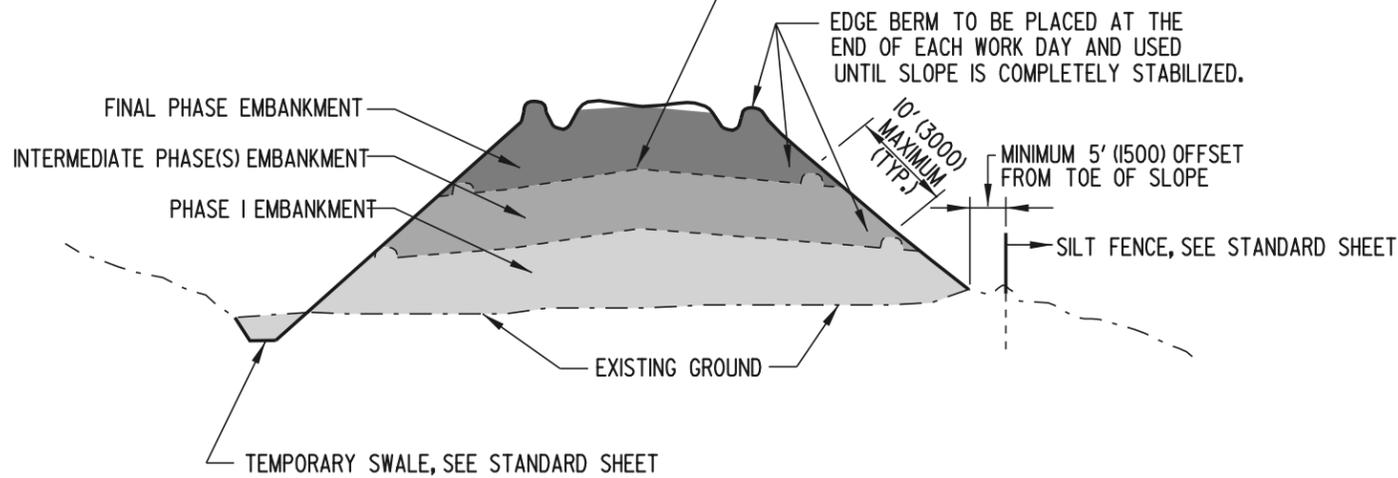


**CUT SECTION**

PERIMETER/DIKE SWALE USED AS A CLEAN WATER DIVERSION, SEE STANDARD SHEET

BREAK IN CROSS SLOPE MAY BE ELIMINATED TO DIRECT SURFACE FLOW LEFT OR RIGHT OR AS DIRECTED BY THE ENGINEER.

- NOTES:**
- 1.) EDGE BERMS AND TEMPORARY SLOPE DRAINS SHALL BE CONSTRUCTED ALONG THE TOP OF ALL SLOPES TO INTERCEPT RUNOFF AND CONVEY IT DOWN THE SLOPE FACES WITHOUT CREATING GULLIES OR WASHOUTS.
  - 2.) SLOPE FACES SHALL BE TRACKED WITH CLEATED EQUIPMENT SUCH THAT THE CLEAT MARKS ARE ORIENTED HORIZONTALLY.
  - 3.) ALL CUT AND FILL SLOPES OF THE HIGHWAY EMBANKMENT SHALL BE PERMANENTLY STABILIZED AS THE WORK PROGRESSES IN INCREMENTS NOT TO EXCEED 10' (3000) MEASURED ALONG THE SLOPE.
  - 4.) CROSS SLOPES SHALL BE 2% MINIMUM, 6% MAXIMUM.



**FILL SECTION**

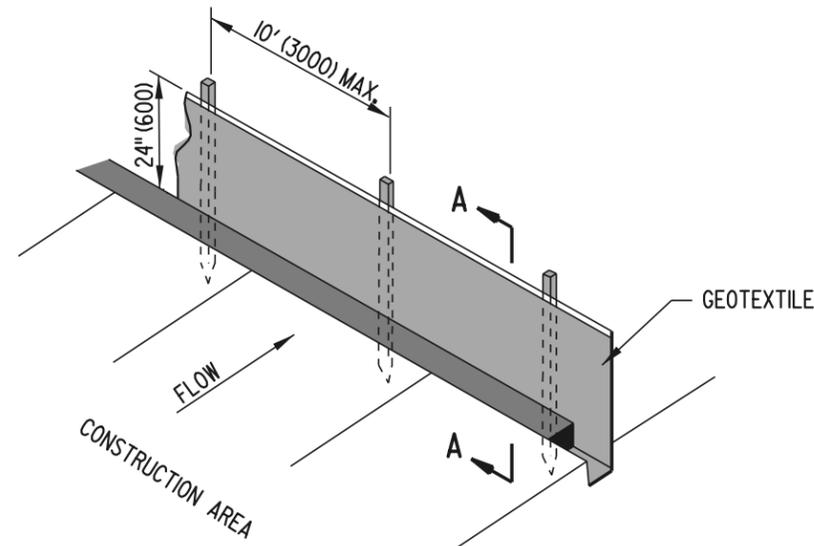


**DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**

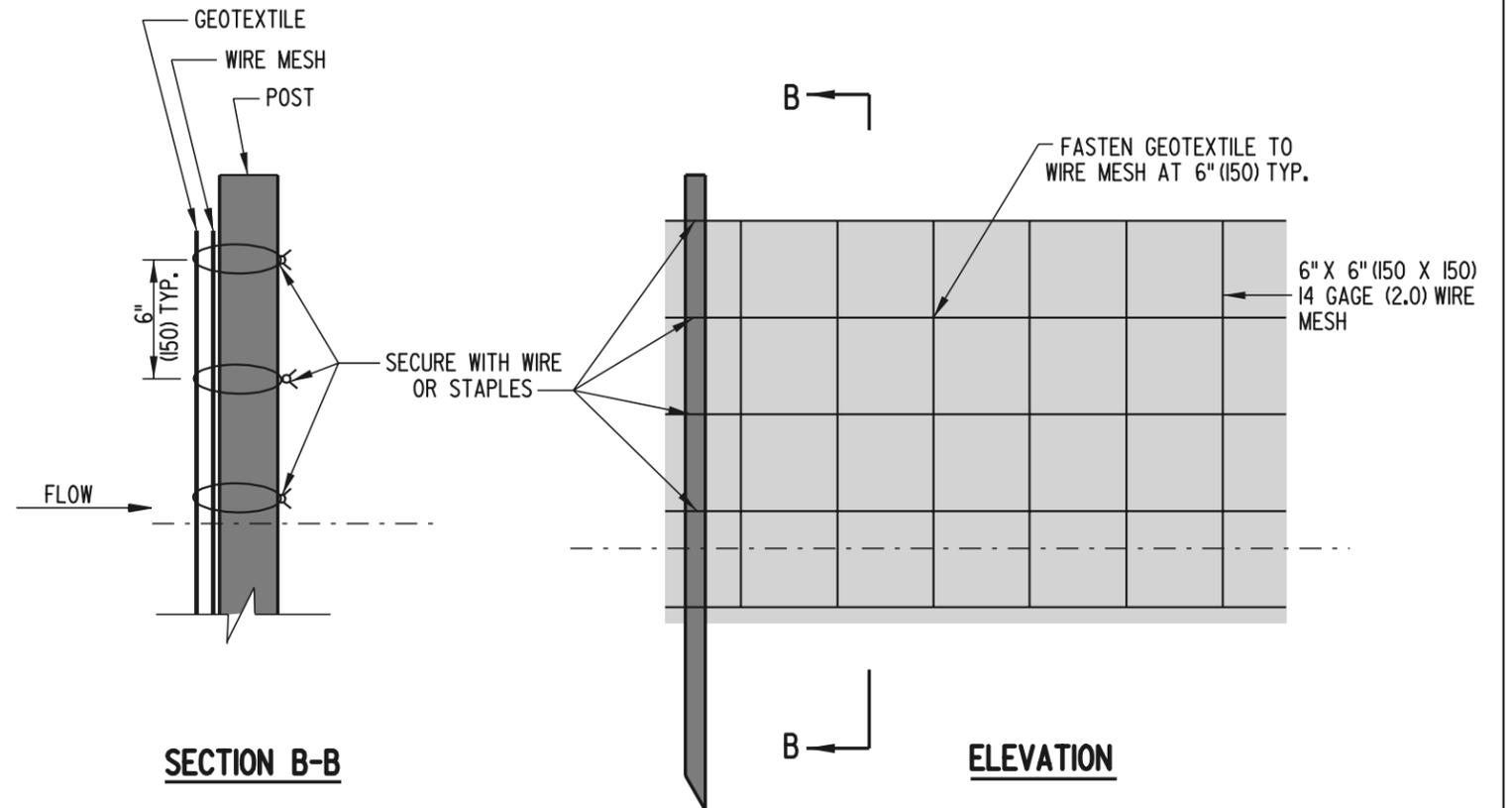
**INCREMENTAL STABILIZATION**

STANDARD NO. **E-1 (2001)** SHT. **1** OF **1**

APPROVED *Ryan M. Harshbarger* 6/18/01  
CHIEF ENGINEER DATE  
 RECOMMENDED *Michael R. Gotsch* 6/18/01  
DESIGN ENGINEER DATE



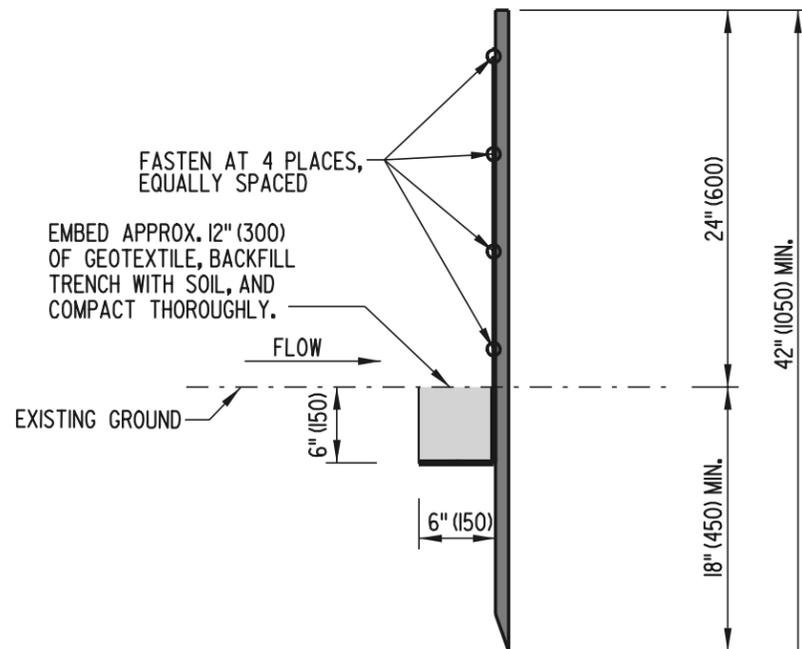
ISOMETRIC VIEW



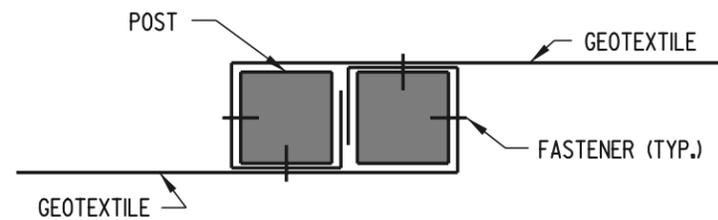
SECTION B-B

ELEVATION

WIRE MESH DETAIL  
(REINFORCED SILT FENCE ONLY)



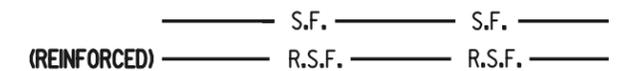
SECTION A-A



CONNECTON DETAIL  
FOR USE WITH JOINING TWO  
ADJACENT SILT FENCE SECTIONS

NOTE: THIS DEVICE IS INTENDED TO CONTROL SHEET FLOW ONLY.  
IT SHALL NOT BE USED IN AREAS OF CONCENTRATED FLOW.

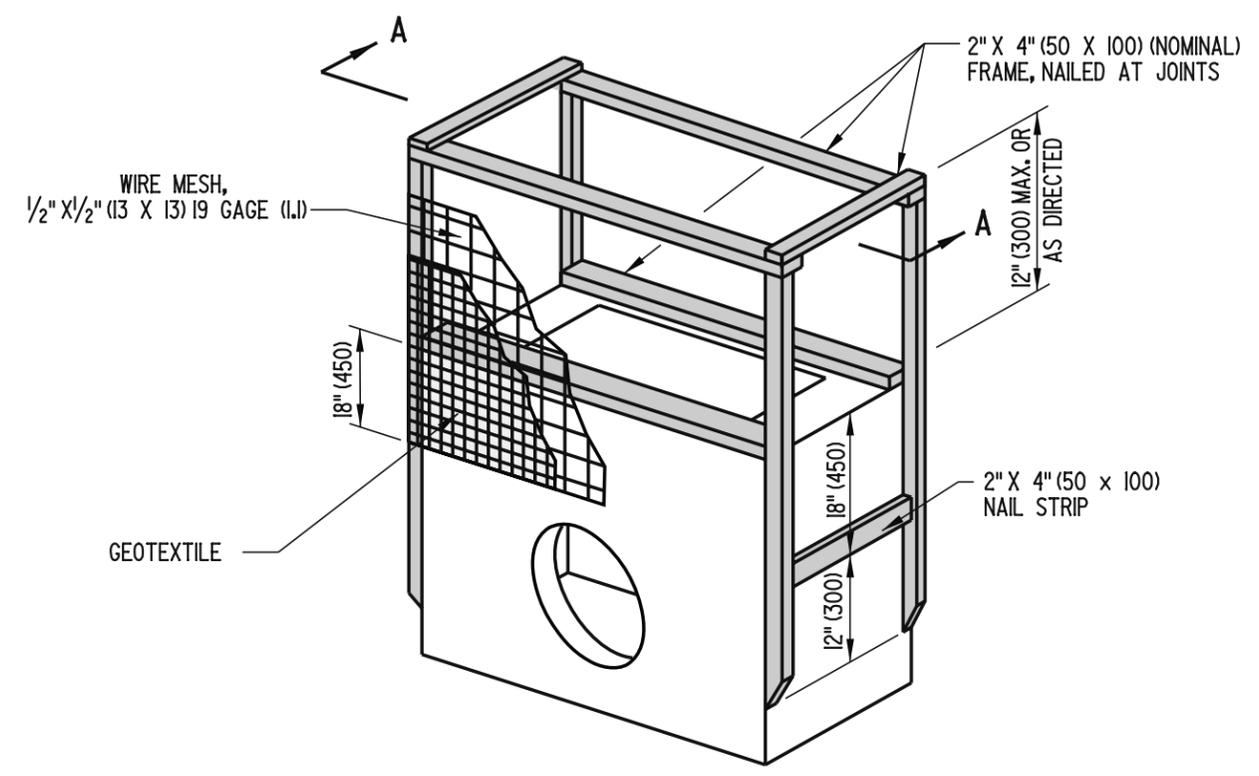
PLAN SYMBOL



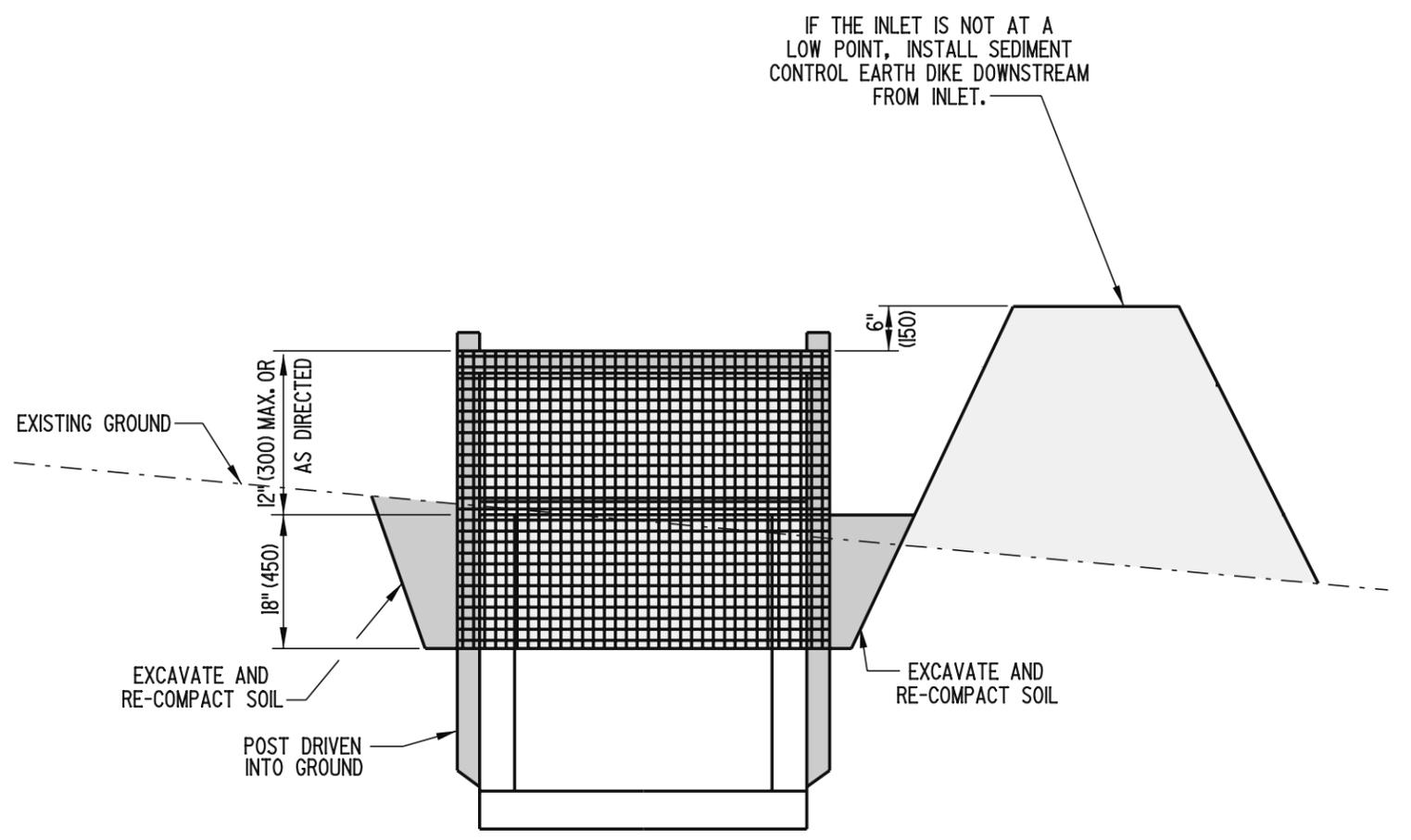
DELAWARE  
DEPARTMENT OF TRANSPORTATION

|              |            |             |                            |         |
|--------------|------------|-------------|----------------------------|---------|
| SILT FENCE   |            | APPROVED    | <i>Ryan M. Harshbarger</i> | 6/18/01 |
| STANDARD NO. | E-2 (2001) | RECOMMENDED | <i>Mehal Alghobari</i>     | 6/18/01 |
| SHT.         | 1          | OF          | 1                          |         |

CHIEF ENGINEER DATE  
DESIGN ENGINEER DATE



**ISOMETRIC VIEW**



**SECTION A-A**



**DELAWARE  
DEPARTMENT OF TRANSPORTATION**

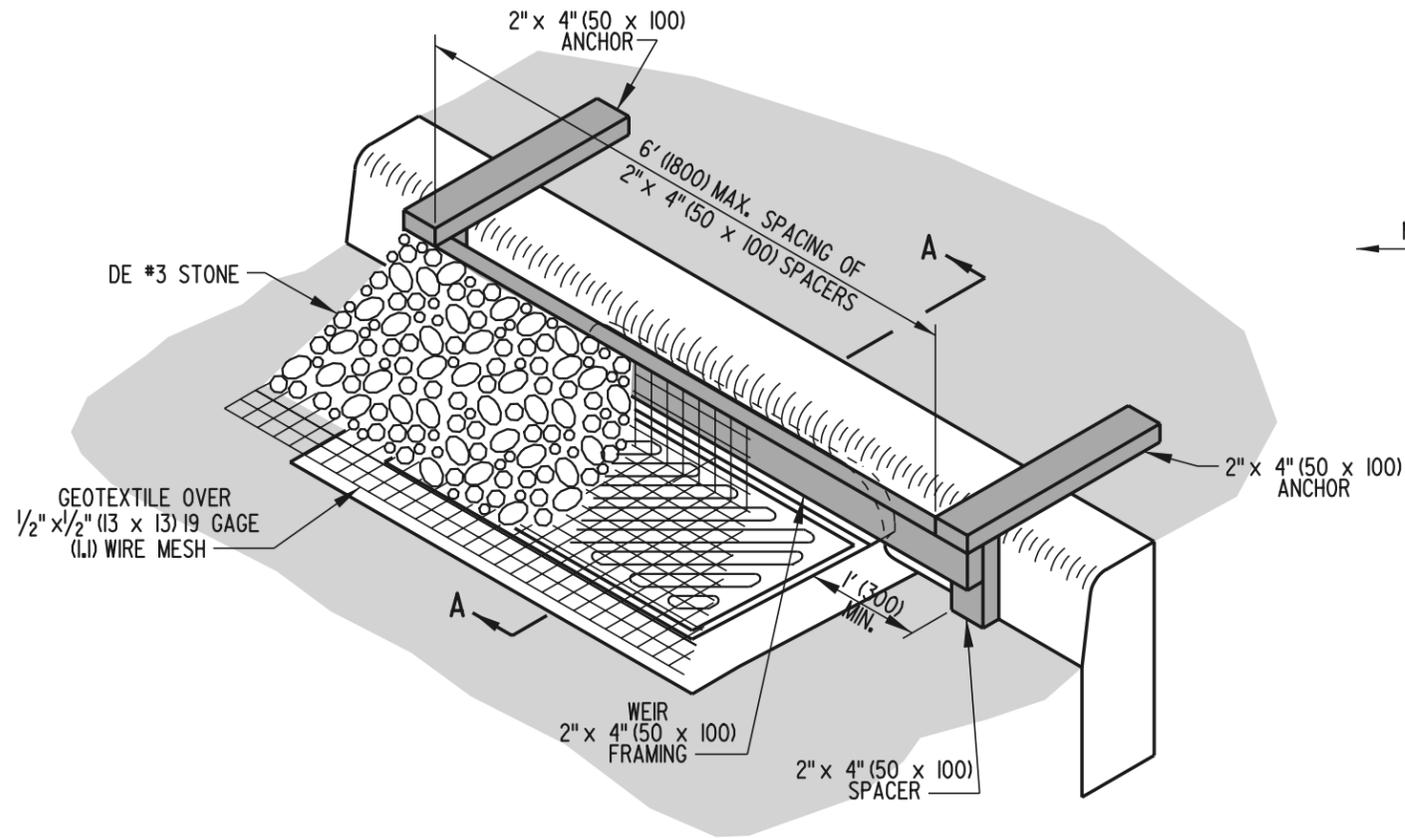
**DRAINAGE INLET SEDIMENT CONTROL**

STANDARD NO. **E-3 (2005)**

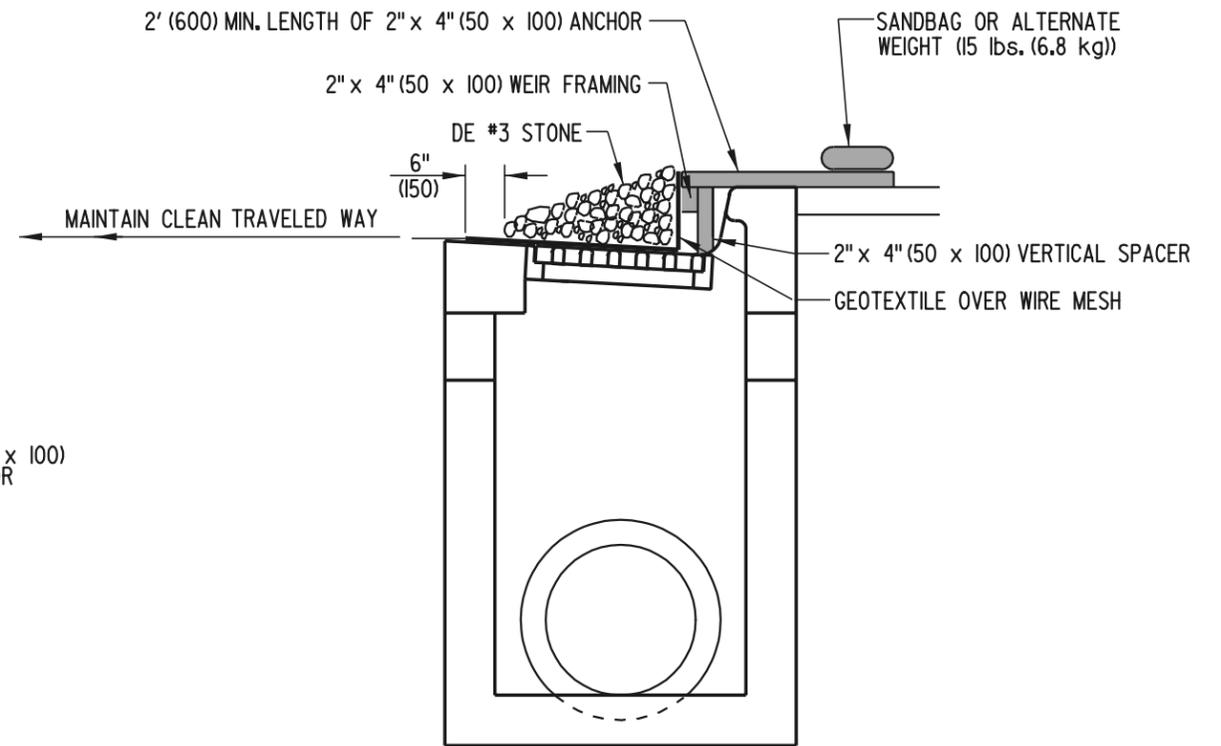
SHT. **1** OF **1**

APPROVED *Candace Wick* **12/5/05**  
CHIEF ENGINEER DATE

RECOMMENDED *James M. O'Brien* **11/29/05**  
DESIGN ENGINEER DATE



**ISOMETRIC VIEW**



**SECTION A-A**

**PLAN SYMBOL**



**DELAWARE  
DEPARTMENT OF TRANSPORTATION**

**CURB INLET SEDIMENT CONTROL**

STANDARD NO.

E-4 (2001)

SHT. 1

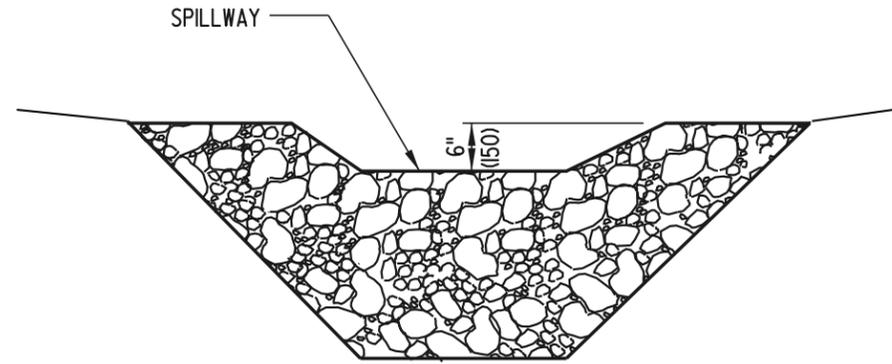
OF 1

APPROVED

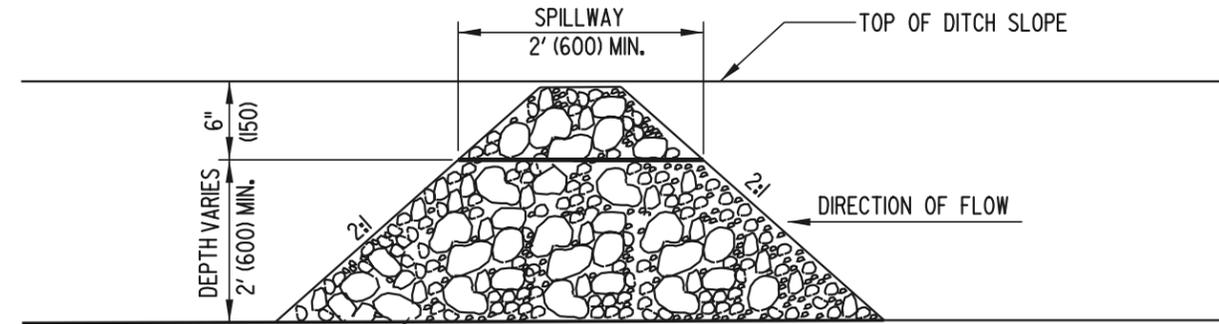
*Ryan M. Harshbarger*  
CHIEF ENGINEER DATE 6/18/01

RECOMMENDED

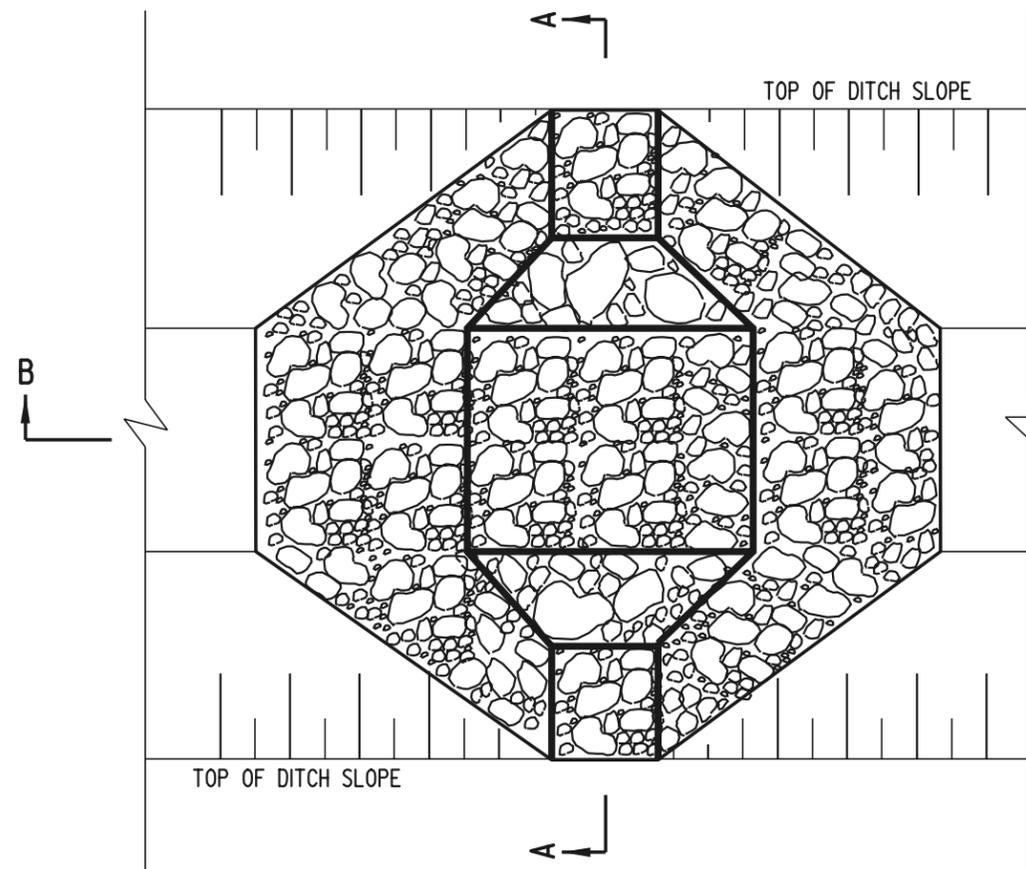
*Mehal Alghobari*  
DESIGN ENGINEER DATE 6/18/01



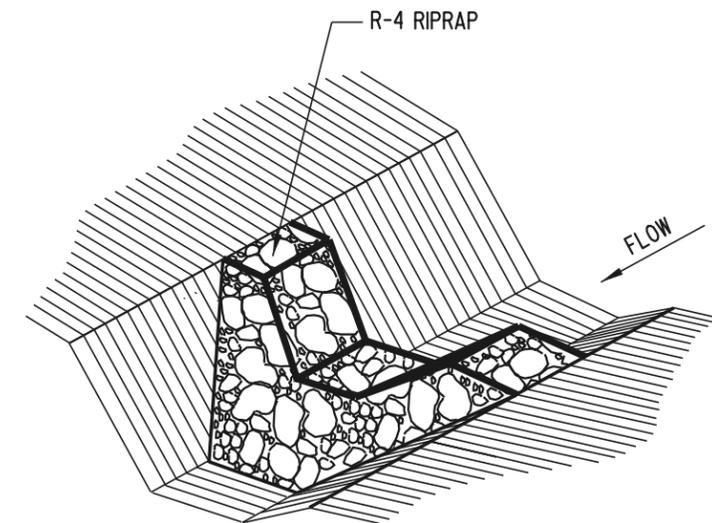
**SECTION A-A**



**SECTION B-B**



**PLAN**



**ISOMETRIC VIEW**

- NOTES:**
- 1). STONE CHECK DAMS ARE INTENDED FOR USE IN EXISTING, PROPOSED, AND TEMPORARY DITCHES OF ALL TYPES AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.
  - 2). FOR DITCHES LESS THAN 30" (750) IN DEPTH, PLACE DAM AS DIRECTED.

**PLAN SYMBOL**



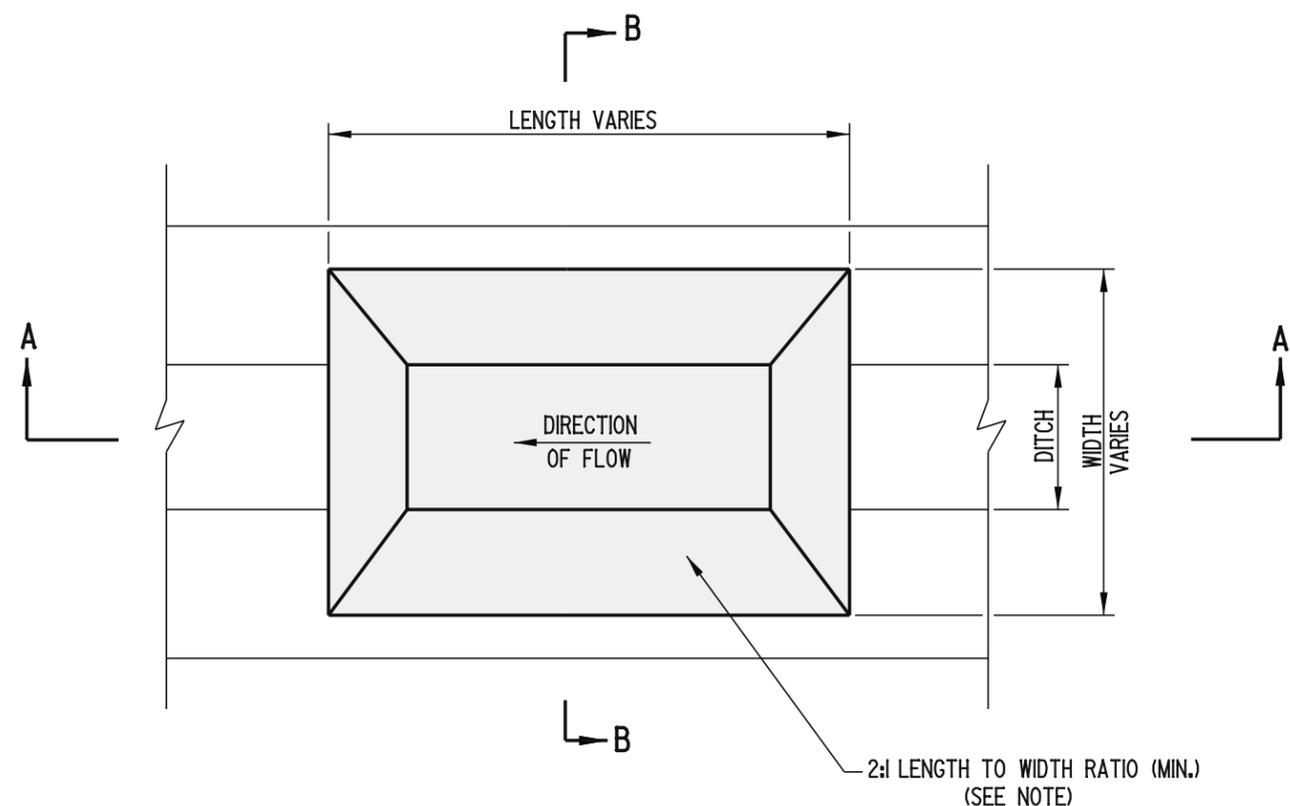
**DELAWARE  
DEPARTMENT OF TRANSPORTATION**

**STONE CHECK DAM**

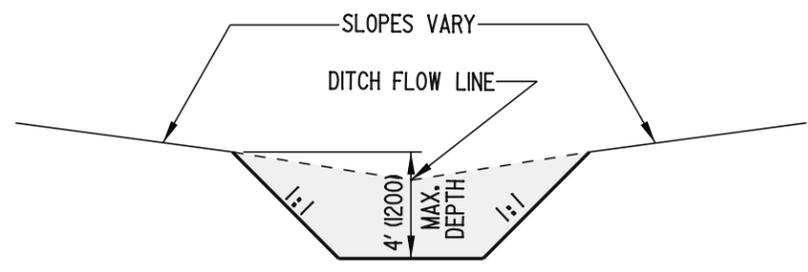
STANDARD NO. **E-5 (2001)** SHT. **1** OF **1**

APPROVED *Ryan M. Harshbarger* **6/18/01**  
CHIEF ENGINEER DATE

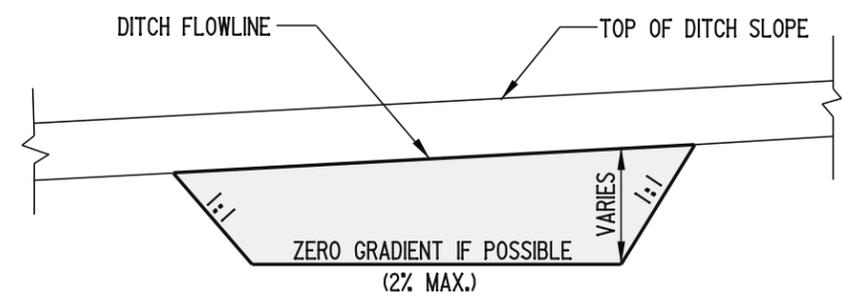
RECOMMENDED *Mehal P. [Signature]* **6/18/01**  
DESIGN ENGINEER DATE



**PLAN**



**SECTION B-B**



**SECTION A-A**

- NOTES:**
- 1). SEDIMENT TRAPS ARE INTENDED FOR USE IN EXISTING, PROPOSED, AND TEMPORARY DITCHES OF ALL TYPES WITH A MAXIMUM DRAINAGE AREA OF 15 ACRES (6 HECTARES), AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.
  - 2). SIDE SLOPES SHALL BE STABILIZED WITH "TEMPORARY GRASS SEEDING, DRY GROUND" AND STRAW MULCH.
  - 3). AN OUTLET STRUCTURE IS REQUIRED. STONE CHECK DAMS, PERFORATED RISER PIPES, SKIMMER DEWATERING DEVICES, OR DRAINAGE INLETS MAY BE USED. SEE APPROPRIATE STANDARD SHEET FOR ADDITIONAL INFORMATION.
  - 4). FOR SIZE, LOCATION, ETC. OF SEDIMENT TRAP, SEE CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLANS.
  - 5). ALL FILL SLOPES SHALL BE 2:1.
  - 6). A 2:1 LENGTH TO WIDTH RATIO SHOULD BE ACHIEVED WHERE POSSIBLE. IF THIS IS NOT POSSIBLE, THE USE OF BAFFLES OR OTHER SPECIAL DESIGNS SHOULD BE INCORPORATED TO INCREASE FLOW TIME.

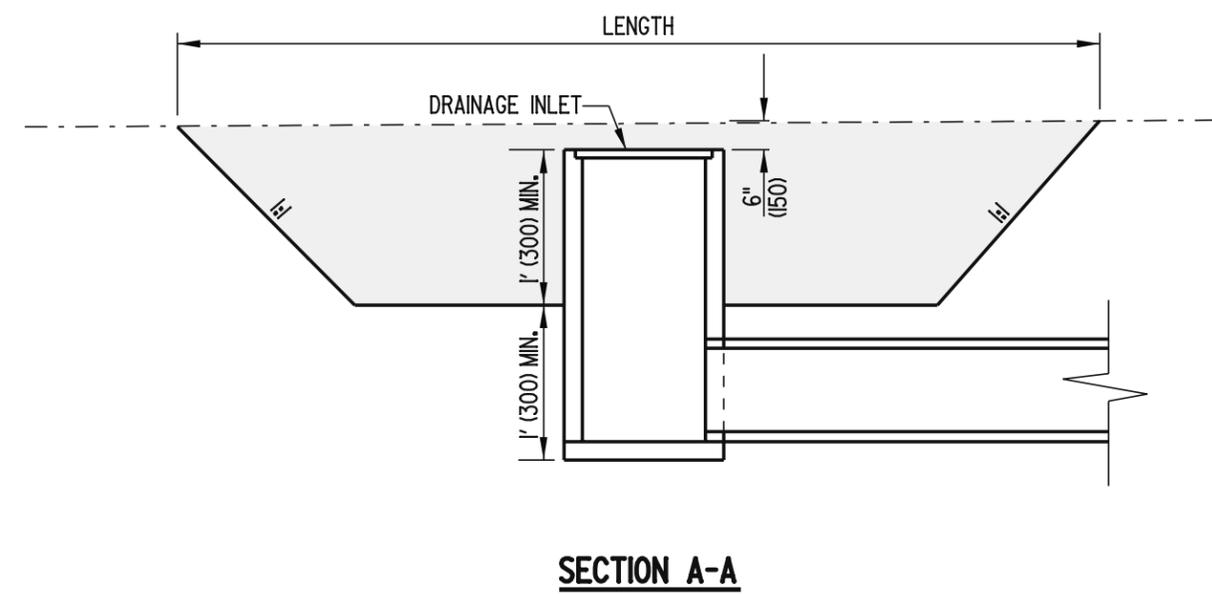
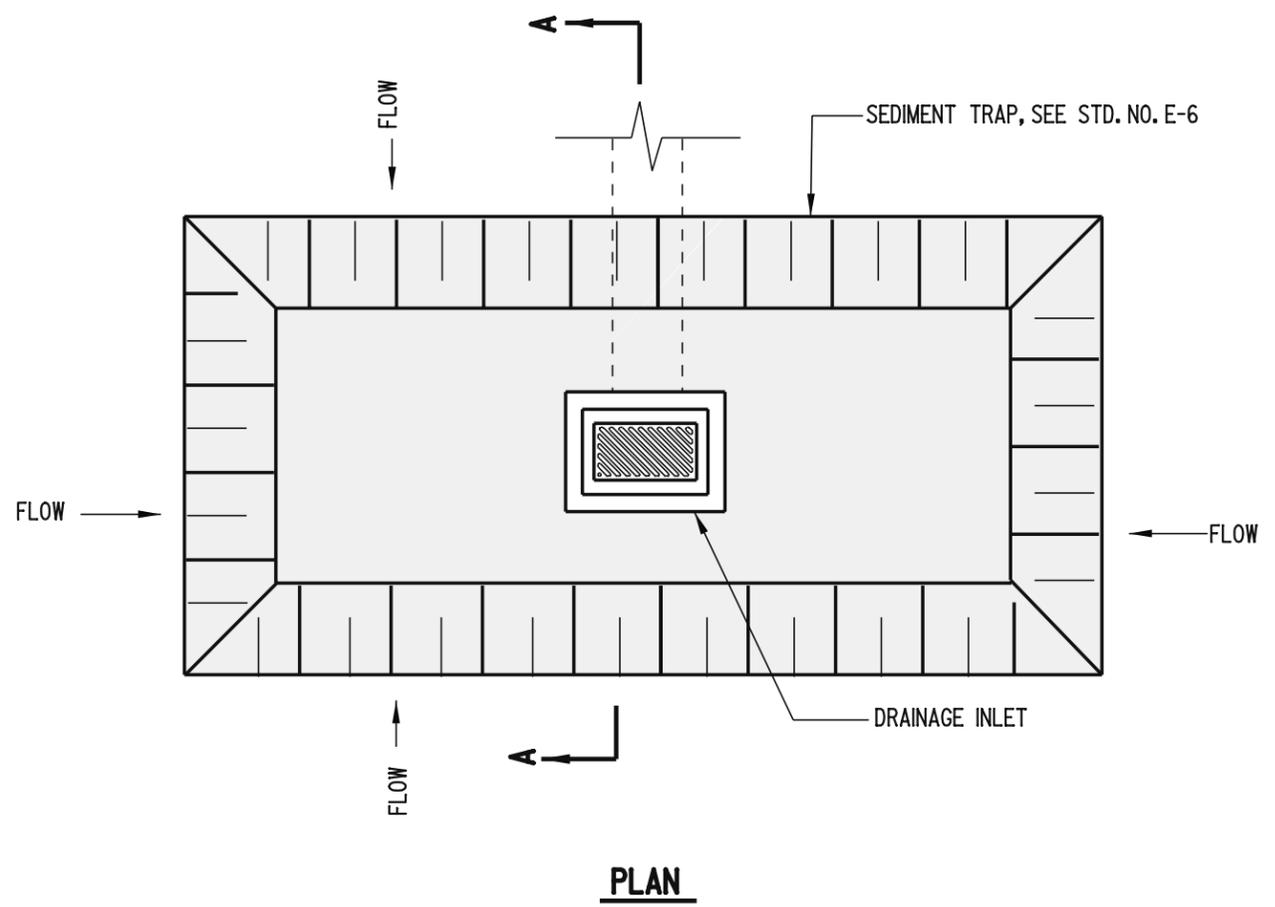


DELAWARE  
DEPARTMENT OF TRANSPORTATION

|                      |            |      |        |
|----------------------|------------|------|--------|
| <b>SEDIMENT TRAP</b> |            |      |        |
| STANDARD NO.         | E-6 (2005) | SHT. | 1 OF 1 |

APPROVED *Carolann Wick* 12/5/05  
CHIEF ENGINEER DATE

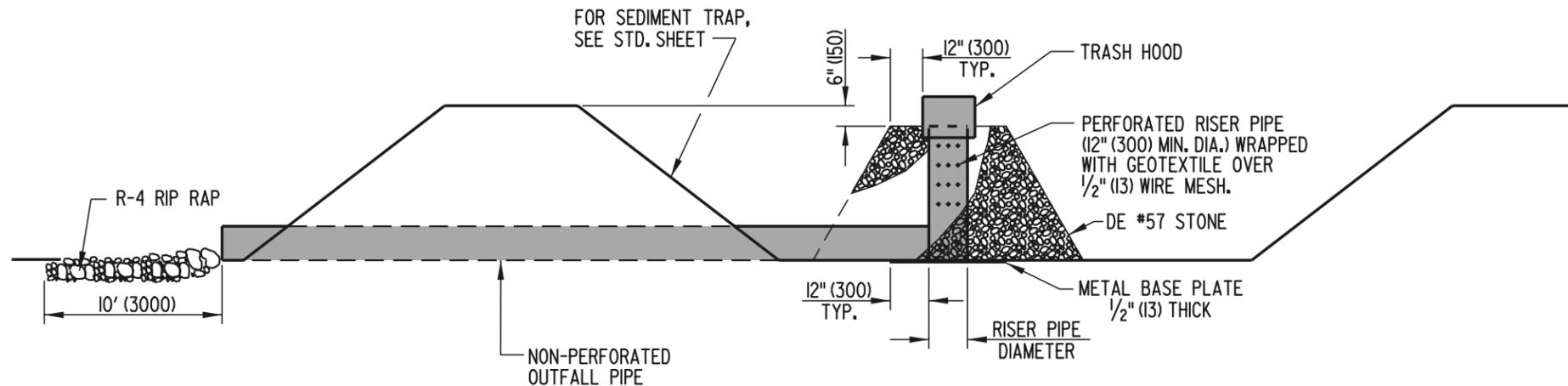
RECOMMENDED *James M. O'Brien* 11/29/05  
DESIGN ENGINEER DATE



- NOTES:**
- 1). THE WORK SHALL CONSIST OF THE CONSTRUCTION OF A SEDIMENT TRAP AROUND A DRAINAGE INLET TO ALLOW SEDIMENTATION TO OCCUR BEFORE RUNOFF ENTERS THE DRAINAGE INLET.
  - 2). DRAINAGE INLET SEDIMENT TRAPS SHALL BE LIMITED TO A THREE (3) ACRE (1.2 HECTARE) MAXIMUM DRAINAGE AREA.
  - 3). THE DIMENSIONS OF THE DRAINAGE INLET SEDIMENT TRAP ARE TO BE AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

| MIN. *<br>OUTFALL<br>PIPE DIA. | MIN.<br>RISER DIA. | MAX. DRAINAGE<br>AREA<br>ACRES (ha) |
|--------------------------------|--------------------|-------------------------------------|
| 12" (300)                      | 15" (375)          | 1 (0.4)                             |
| 15" (375)                      | 18" (450)          | 2 (0.8)                             |
| 18" (450)                      | 21" (525)          | 3 (1.2)                             |
| 21" (525)                      | 24" (600)          | 4 (1.6)                             |
| 24" (600)                      | 27" (675)          | 5 (2.0)                             |

\* OUTFALL PIPE DIAMETER MAY BE SAME SIZE AS RISER DIAMETER.



**ELEVATION**

- NOTES:**
- 1). THIS DEVICE IS INTENDED TO BE USED AS AN OUTLET FOR SEDIMENT TRAPS.
  - 2). PERFORATIONS SHALL BE 1" (25) IN DIAMETER, LOCATED IN CONCAVE PORTIONS OF PIPE, SPACED 6" (150) HORIZONTALLY AND VERTICALLY, AND SHALL NOT BE MADE ANY LOWER THAN 6" (150) ABOVE THE TOP OF THE OUTFALL PIPE.
  - 3). THE PIPE OUTLET SHOWN SHALL ONLY BE USED WITH SEDIMENT TRAPS WITH DRAINAGE AREAS OF 5 ACRES (2.0 HECTARES) OR LESS. LARGER DRAINAGE AREAS WILL REQUIRE AN ENGINEERED DESIGN.

**PLAN SYMBOL**

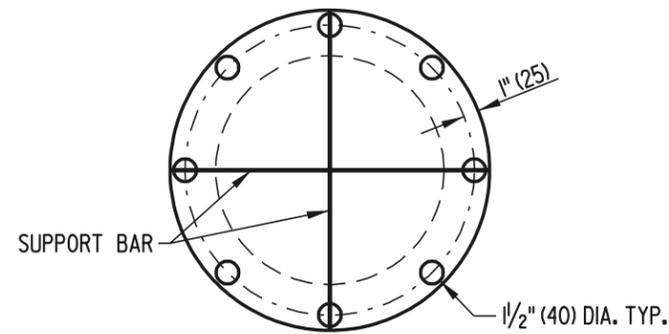


**DELAWARE  
DEPARTMENT OF TRANSPORTATION**

**RISER PIPE ASSEMBLY FOR SEDIMENT TRAP**

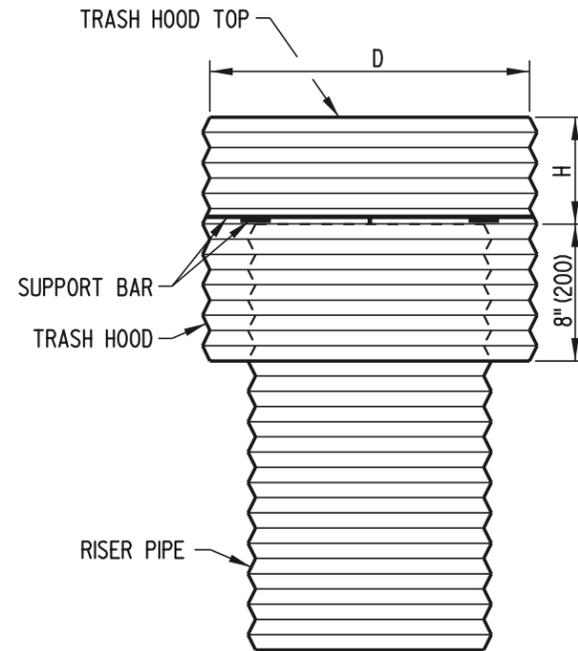
STANDARD NO. **E-8 (2001)** SHT. **1** OF **2**

APPROVED *Ryan M. Harkness* 6/18/01  
CHIEF ENGINEER DATE  
 RECOMMENDED *Mehal Akhavan* 6/18/01  
DESIGN ENGINEER DATE

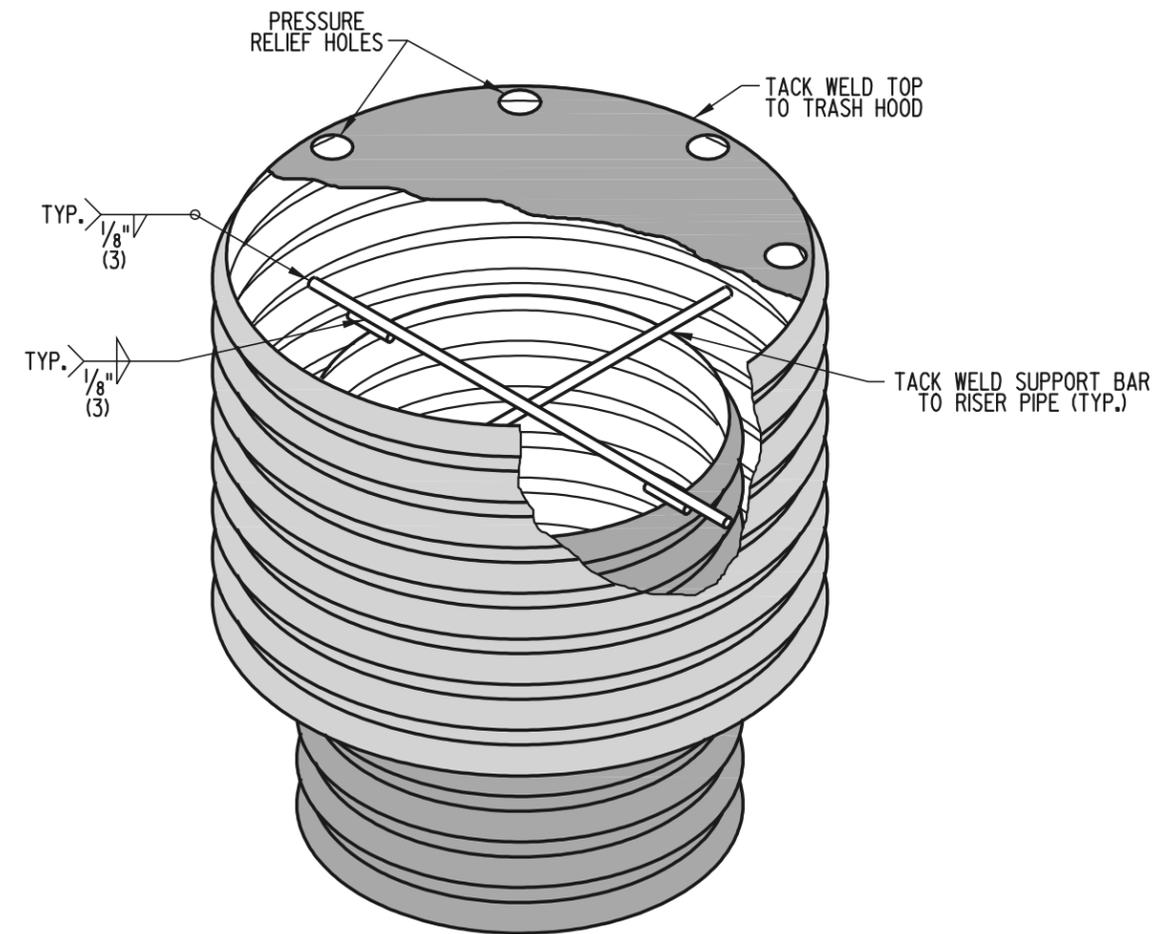


**PLAN**

| TRASH HOOD CHART    |            |           |                          |                          |                           |
|---------------------|------------|-----------|--------------------------|--------------------------|---------------------------|
| RISER PIPE DIAMETER | D          | H         | TRASH HOOD THICK. (GAGE) | MINIMUM SIZE SUPPORT BAR | MINIMUM TOP THICK. (GAGE) |
| 15" (375)           | 21" (525)  | 7" (175)  | 16 (1.6)                 | #6 (#19) REBAR           | 16 (1.6)                  |
| 18" (450)           | 27" (675)  | 8" (200)  | 16 (1.6)                 | #6 (#19) REBAR           | 16 (1.6)                  |
| 21" (525)           | 30" (750)  | 11" (275) | 16 (1.6)                 | #6 (#19) REBAR           | 16 (1.6)                  |
| 24" (600)           | 36" (900)  | 13" (330) | 16 (1.6)                 | #6 (#19) REBAR           | 14 (2.0)                  |
| 27" (675)           | 42" (1050) | 15" (380) | 16 (1.6)                 | #6 (#19) REBAR           | 14 (2.0)                  |
| 36" (900)           | 54" (1350) | 17" (430) | 14 (2.0)                 | #8 (#25) REBAR           | 12 (2.7)                  |



**FRONT**



**ISOMETRIC VIEW**

**TRASH HOOD DETAILS**

**PLAN SYMBOL**



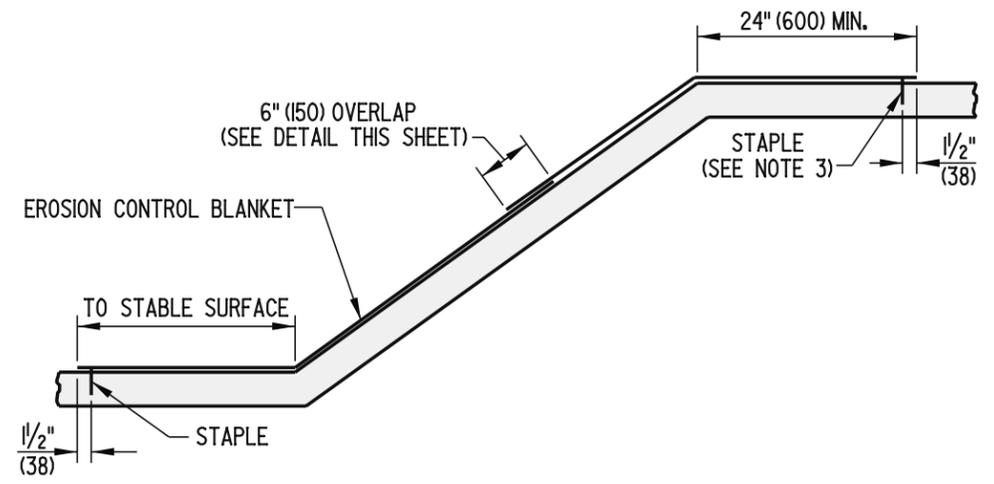
**DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**

**RISER PIPE ASSEMBLY FOR SEDIMENT TRAP**

STANDARD NO. **E-8 (2001)** SHT. **2** OF **2**

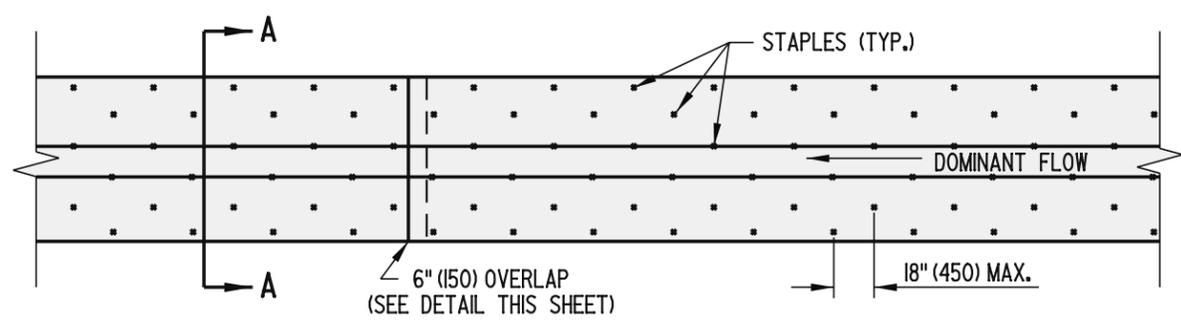
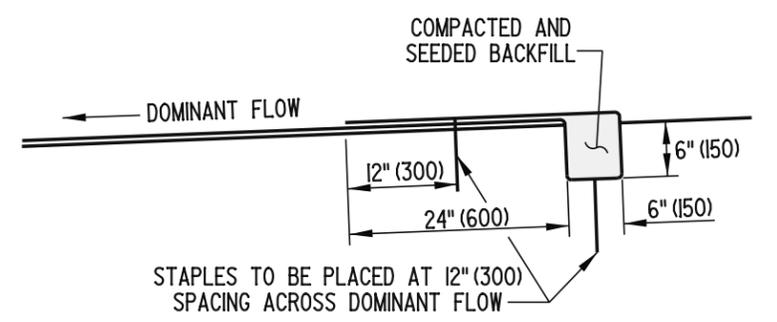
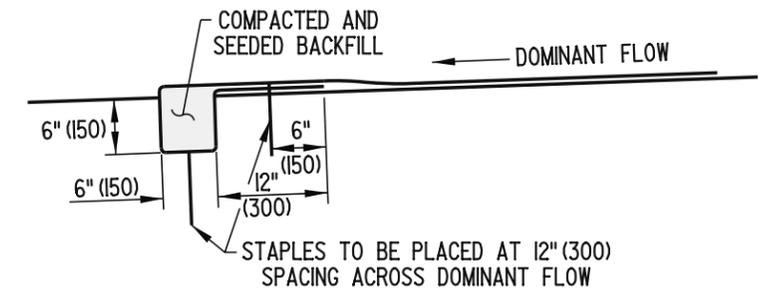
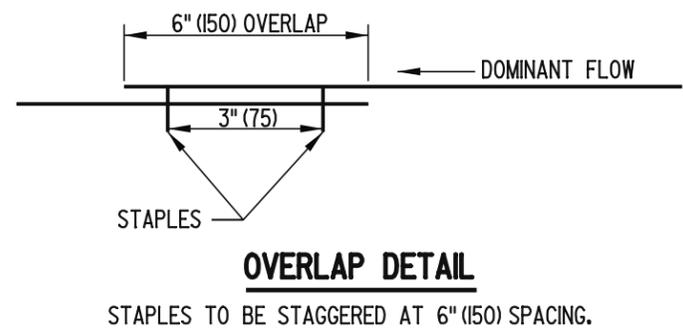
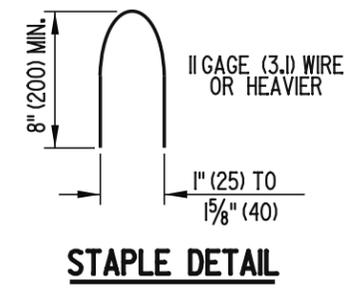
APPROVED *Ryan M. Harshbarger* **6/18/01**  
CHIEF ENGINEER DATE

RECOMMENDED *Mehal Alghobari* **6/18/01**  
DESIGN ENGINEER DATE

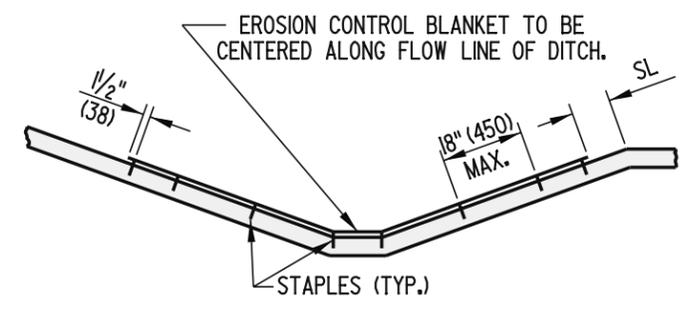


**STABILIZATION OF EMBANKMENTS**

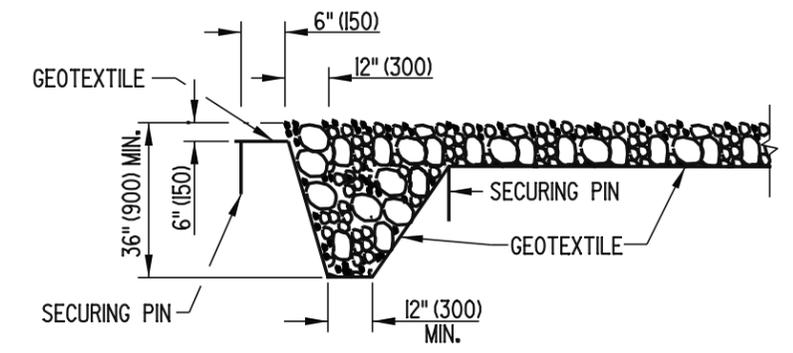
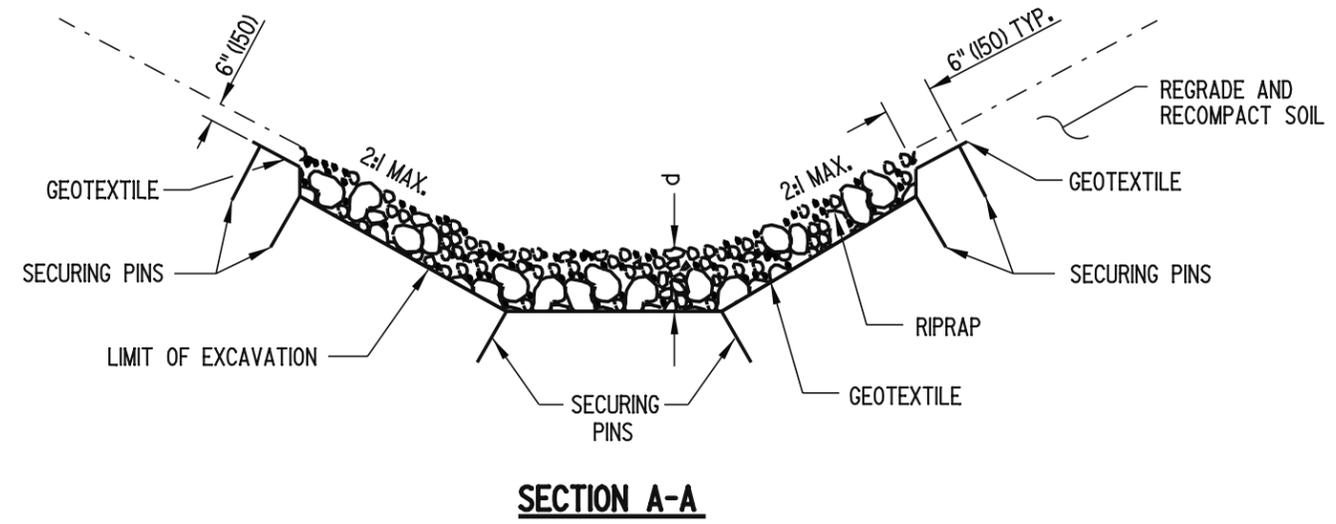
- NOTES:**
1. STAPLES TO BE STAGGERED AT 18" (450) SPACING.
  2. TOPSOIL UNDER EROSION CONTROL BLANKET IS TO BE TRACKED AND SEEDED.
  3. WHEN OFFSITE RUNOFF OCCURS, ADDITIONAL MEASURES AS DIRECTED BY THE ENGINEER SHALL BE USED TO ENSURE STABILITY OF EMBANKMENT.



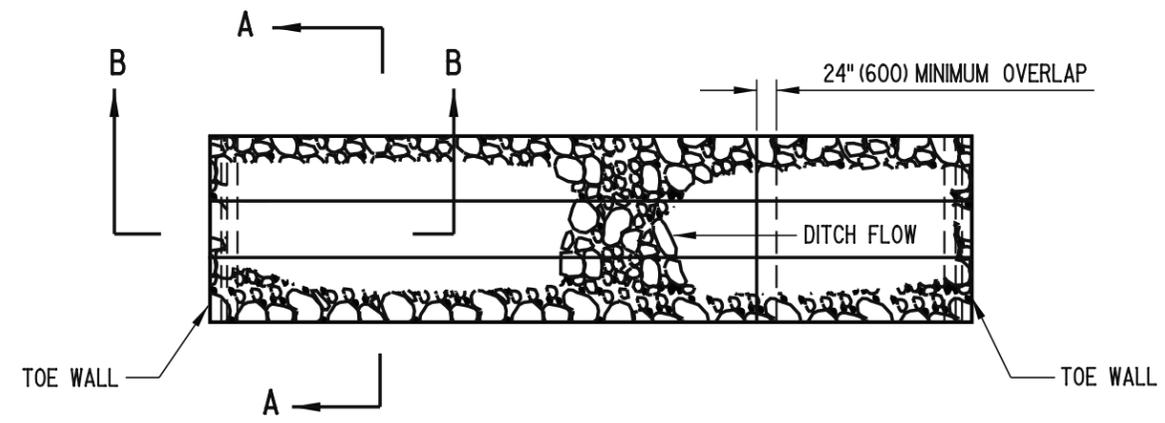
- NOTES:**
1. ADDITIONAL STAPLES NOT SHOWN ARE REQUIRED AT OVERLAPS. SEE OVERLAP DETAIL FOR STAPLE PLACEMENT.
  2. STAPLES ARE TO BE STAGGERED.
  3. TOPSOIL UNDER EROSION CONTROL BLANKET IS TO BE TRACKED AND SEEDED.



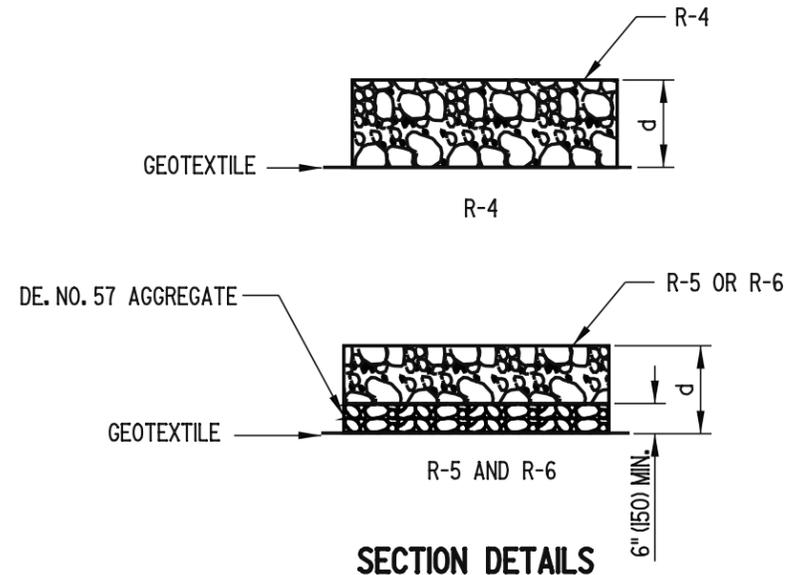
- STAPLES ALONG LONGITUDINAL EDGES SHALL BE SPACED AS FOLLOWS:
- 18" (450) WHEN SL ≤ 20' (6000)
  - 9" (225) WHEN SL > 20' (6000)



**SECTION B-B**



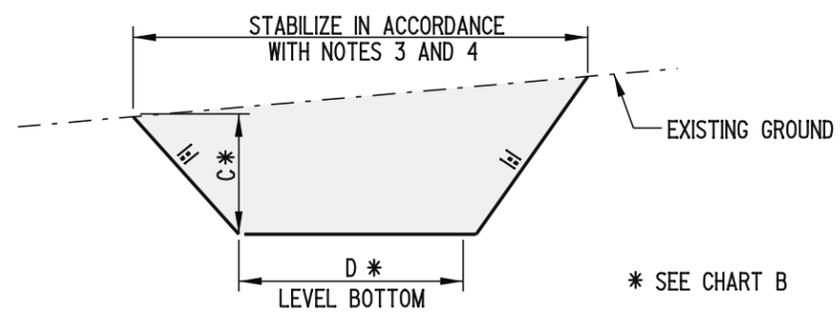
**PLAN**



- CLASS RIPRAP**
- R-4 d = 14" (350) MIN.
  - R-5 d = 26" (650) MIN.
  - R-6 d = 34" (850) MIN.

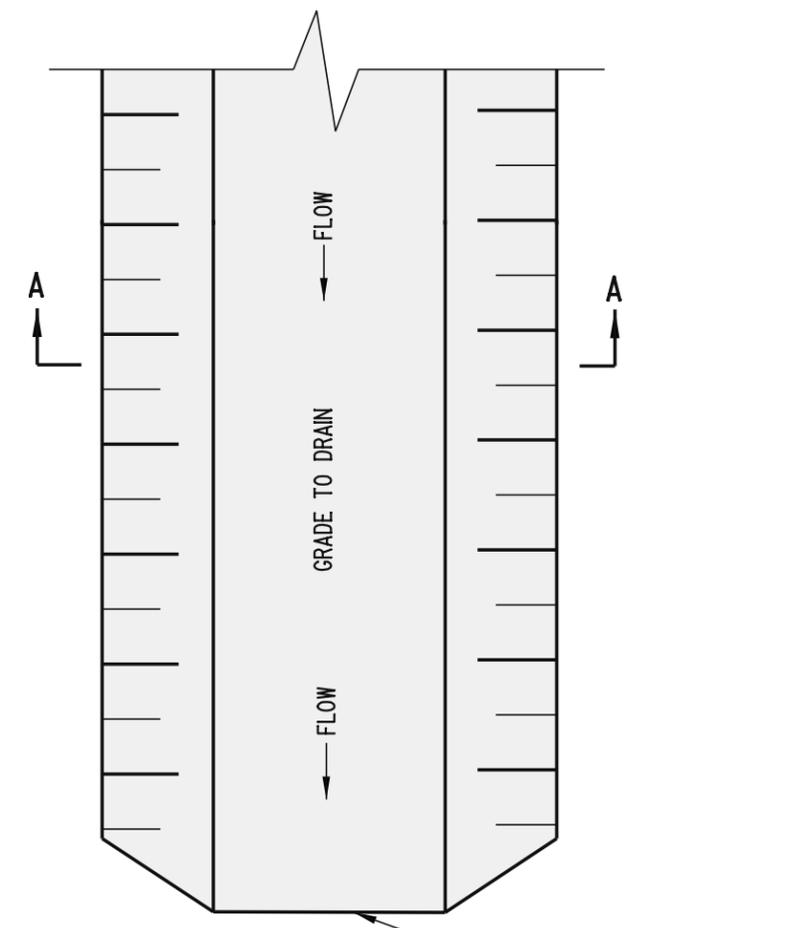
**SECTION DETAILS**

- NOTES:**
- 1). SECURING PINS ARE TO BE PLACED AT LOCATIONS SHOWN AND AT 24" (600) LONGITUDINAL AND LATERAL SPACING.
  - 2). SEE PLANS FOR LOCATION, DIMENSIONS, GRADES, ETC.
  - 3). USE OF R-7 RIPRAP WILL REQUIRE A SEPARATE PROFESSIONAL ENGINEERING DESIGN FOR SIGHT SPECIFIC CONDITIONS.



**SECTION A-A**

| CHART A - STABILIZATION |             |   |  |
|-------------------------|-------------|---|--|
| SYMBOL                  | SWALE GRADE | TYPE OF TREATMENT                         |  |
|                         |             | DRAINAGE AREA A<br>(5 AC (2 ha) OR LESS)  | DRAINAGE AREA B<br>(5 AC - 10 AC<br>(2 ha - 4 ha)) |
| 1                       | 0.5-2.0%    | SEED USED WITH<br>EROSION CONTROL BLANKET | SEED USED WITH<br>EROSION CONTROL BL.              |
| 2                       | 2.1-8.0%    | R-4 RIRRAP                                | R-4 RIRRAP   |
| 3                       | 8.1-20%     | ENGINEERED DESIGN                         | ENGINEERED DESIGN                                  |

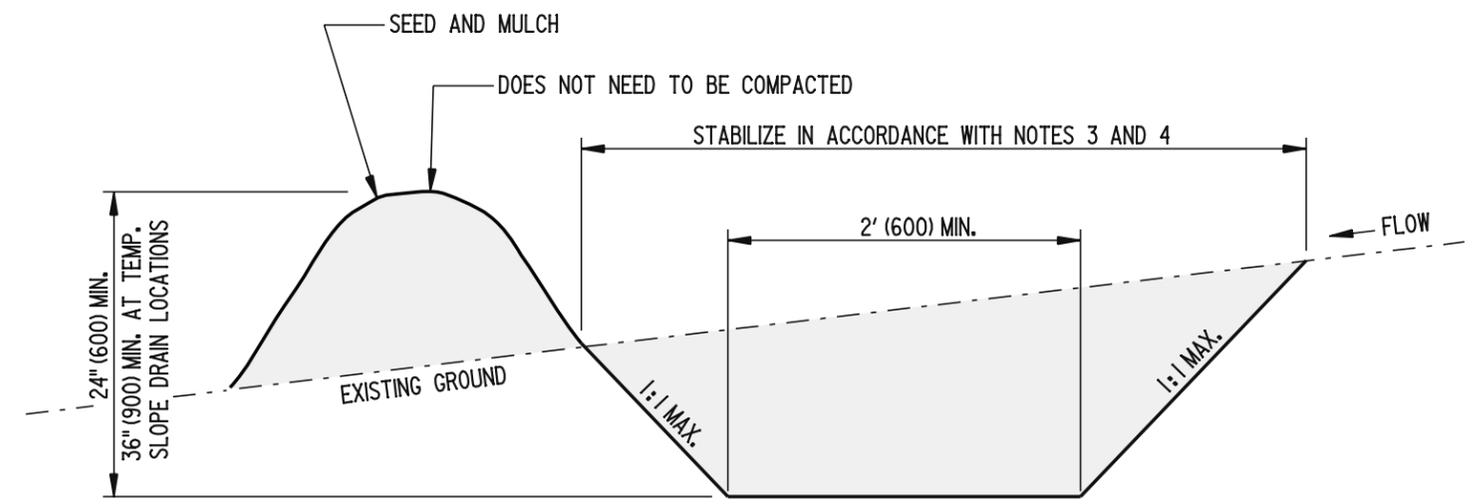


**PLAN**

| CHART B - SWALE DIMENSIONS |                |                |
|----------------------------|----------------|----------------|
| SYMBOL                     | SWALE A        | SWALE B        |
| C                          | 1' (300) MIN.  | 1' (300) MIN.  |
| D                          | 4' (1200) MIN. | 6' (1800) MIN. |

SEE SECTION A - A

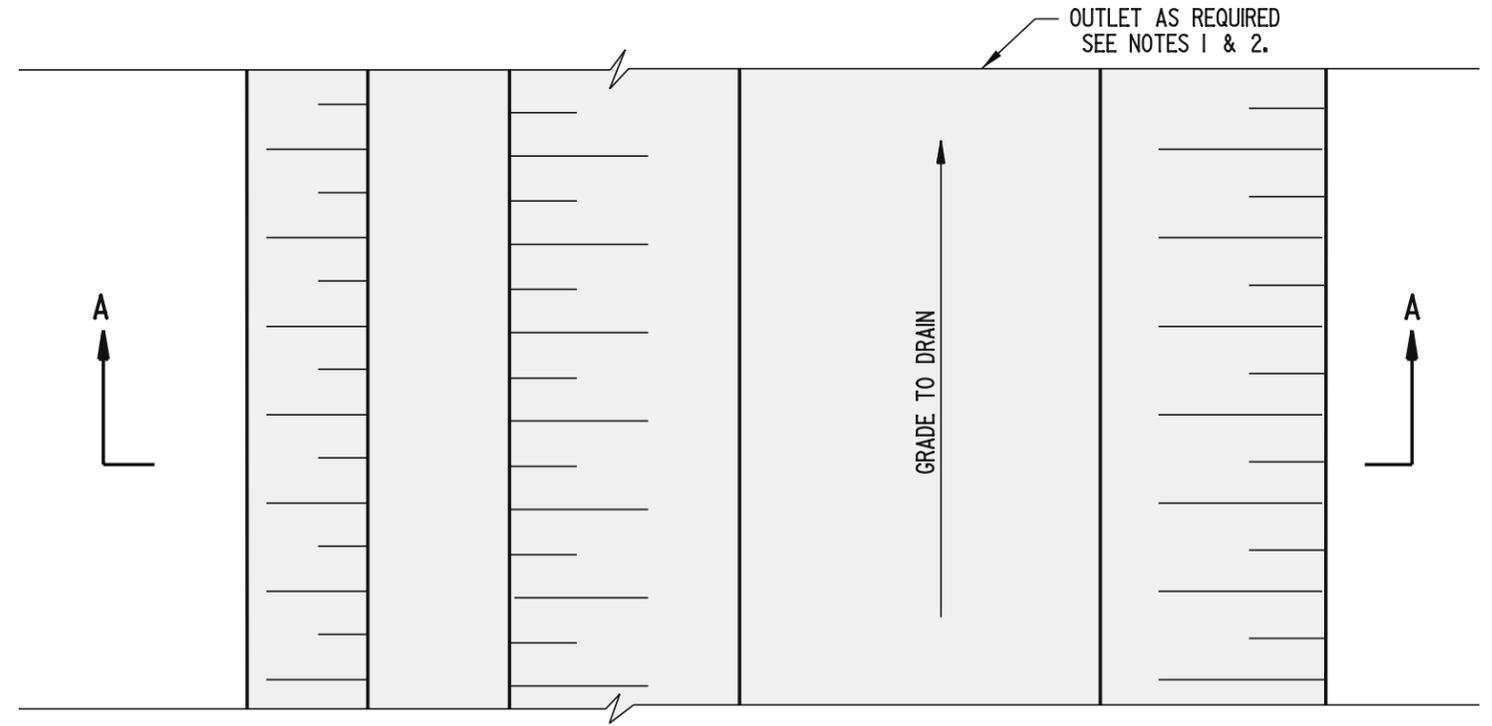
- NOTES:**
- DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
  - DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
  - IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR MORE THAN 14 DAYS, THEY SHALL BE STABILIZED IN ACCORDANCE WITH CHART A PRIOR TO BECOMING OPERATIONAL.
  - IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 14 DAYS, THEY SHALL BE STABILIZED WITH GEOTEXTILE IN ACCORDANCE WITH THE STANDARD DETAIL, "GEOTEXTILE-LINED CHANNEL DIVERSION".



**SECTION A-A**

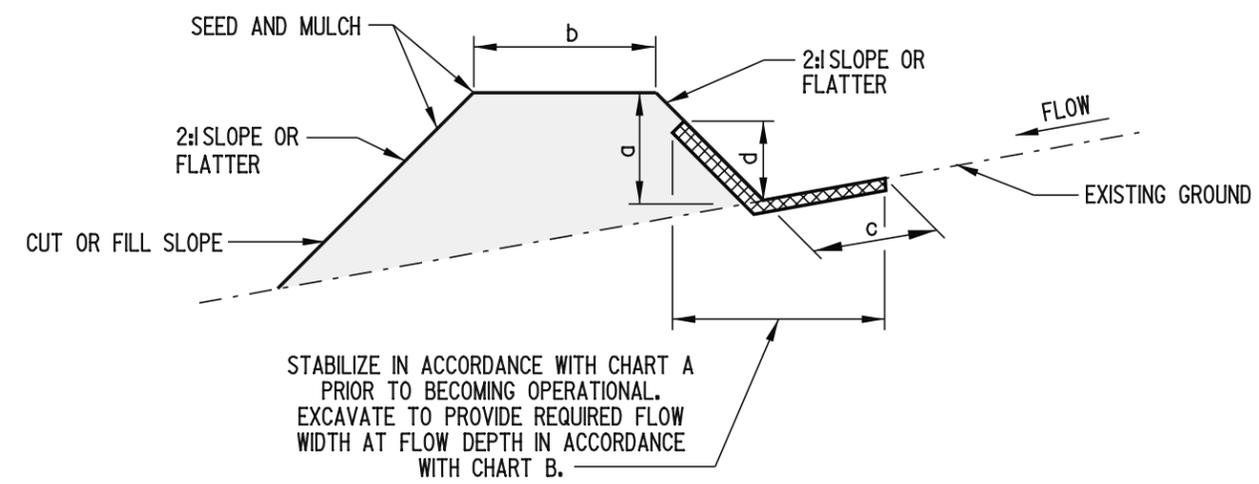
| CHART A - SWALE STABILIZATION |             |                                  |
|-------------------------------|-------------|----------------------------------|
| SYMBOL                        | SWALE GRADE | TYPE OF TREATMENT                |
| A-1                           | 0.5-2.0%    | SEED AND EROSION CONTROL BLANKET |
| A-2                           | 2.1-8.0%    | LINED R-4 RIPRAP                 |
| A-3                           | 8.1-20%     | ENGINEERED DESIGN                |

MAXIMUM DRAINAGE AREA: 2 ACRES (0.8 ha)



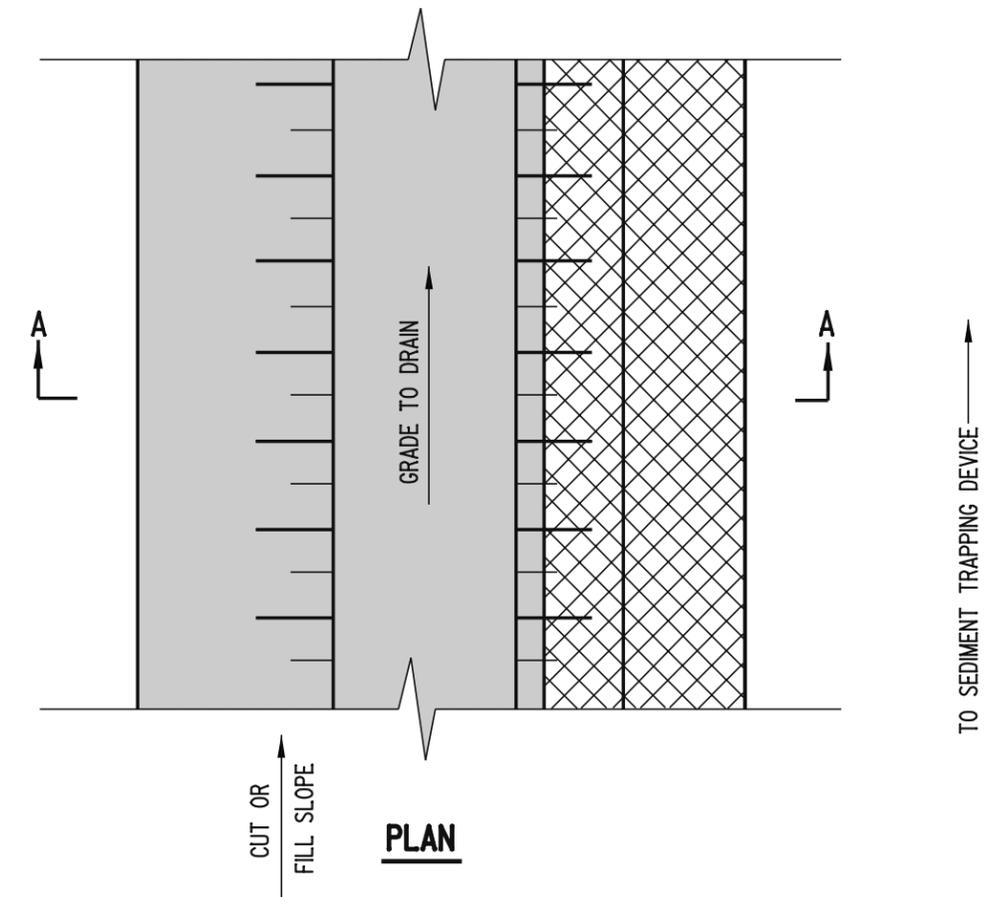
**PLAN**

- NOTES:**
- DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
  - DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.
  - IF PERIMETER DIKE SWALES ARE TO BE OPERATIONAL FOR MORE THAN 14 DAYS, THEY SHALL BE STABILIZED IN ACCORDANCE WITH CHART A PRIOR TO BECOMING OPERATIONAL.
  - IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 14 DAYS, THEY SHALL BE STABILIZED WITH GEOTEXTILE IN ACCORDANCE WITH THE STANDARD DETAIL, "GEOTEXTILE-LINED CHANNEL DIVERSION".



| TYPE | CHANNEL GRADE | TYPE OF TREATMENT                |
|------|---------------|----------------------------------|
| 1    | 0.5-2.0%      | SEED AND EROSION CONTROL BLANKET |
| 2    | 2.1-8.0%      | R-4 RIPRAP                       |
| 3    | 8.1-20%       | ENGINEERED DESIGN                |

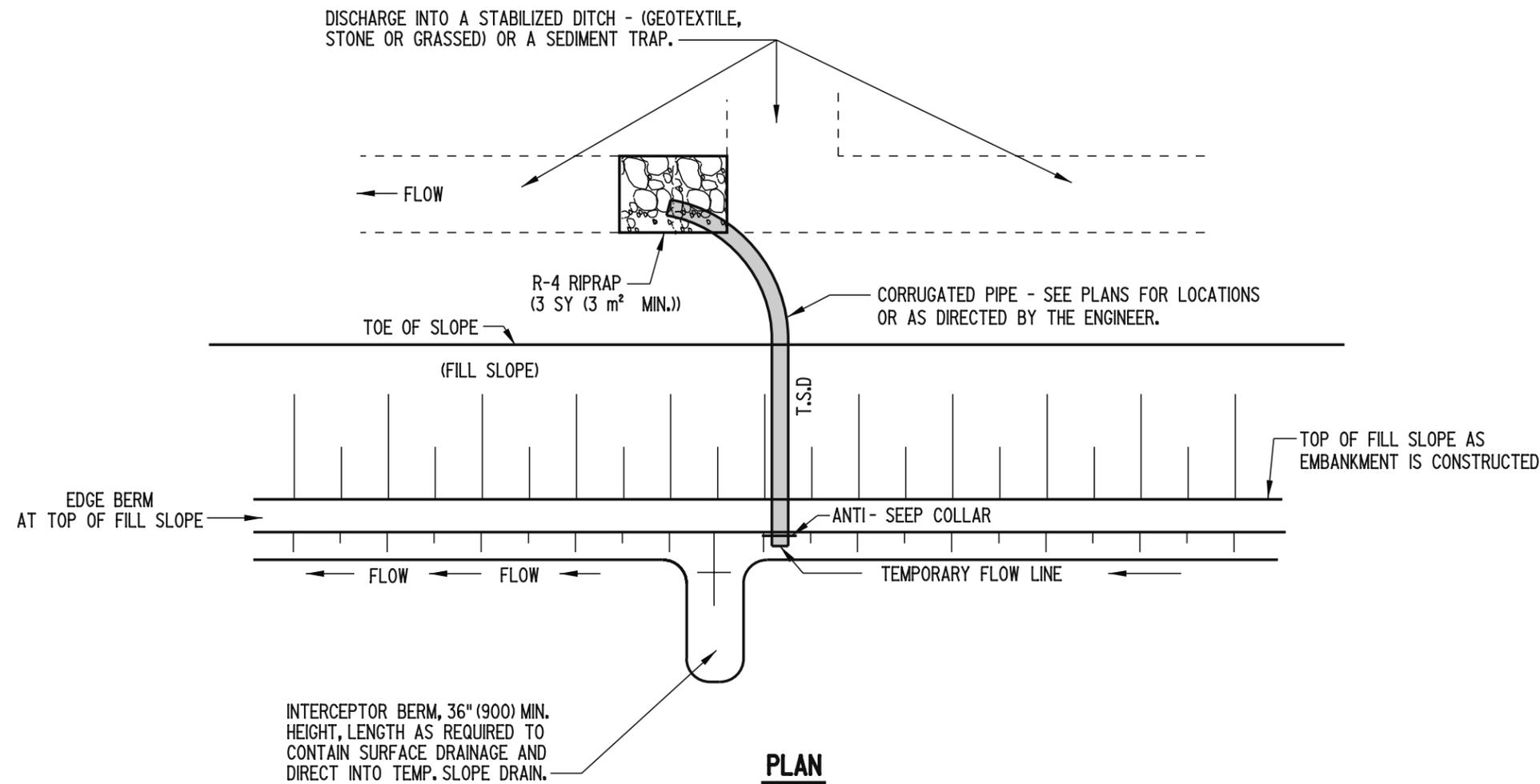
**SECTION A-A**



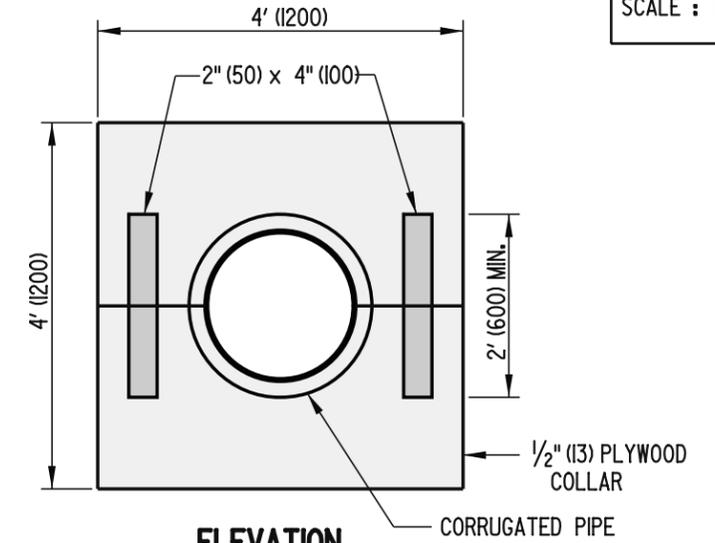
| SYMBOL        | DIKE A<br>(5 ac (2 ha) or less) | DIKE B<br>(5-10ac(2-4 ha)) |
|---------------|---------------------------------|----------------------------|
| a-DIKE HEIGHT | 12" (300)                       | 18" (450)                  |
| b-DIKE WIDTH  | 12" (300)                       | 24" (600)                  |
| c-FLOW WIDTH  | 48" (1200)                      | 72" (1800)                 |
| d-FLOW DEPTH  | 14" (350)                       | 27" (680)                  |

- NOTES:**
- 1). IF DESIRED, TOP WIDTH MAY BE WIDER AND SIDE SLOPES MAY BE FLATTER TO FACILITATE CROSSING BY CONSTRUCTION TRAFFIC.
  - 2). FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO INSURE A STABILIZED OUTFALL.

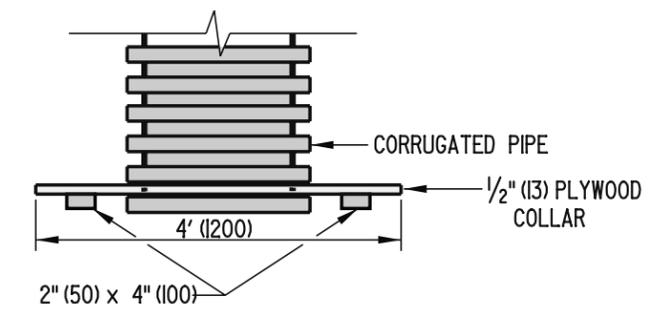
SCALE : N.T.S.



**PLAN**

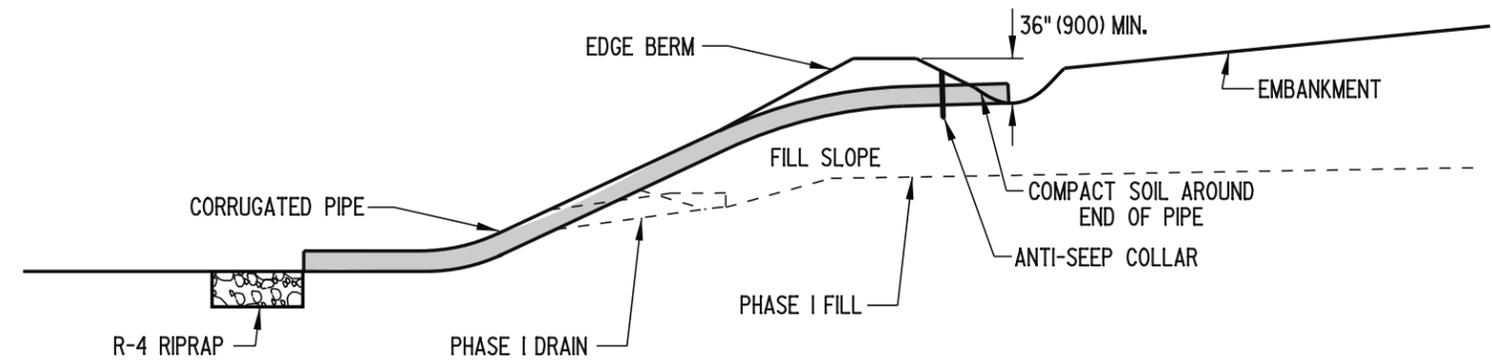


**ELEVATION**



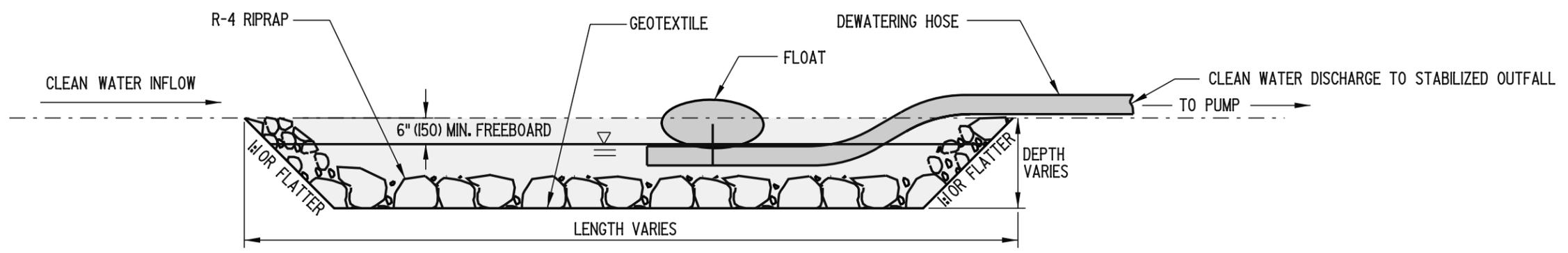
**PLAN**

**ANTI-SEEP COLLAR**



**SLOPE DRAIN PROFILE  
(FOR FILL SLOPES)**

- NOTES:**
- 1). ALL TEMPORARY SLOPE DRAINS SHALL DISCHARGE INTO THE BACK OF SEDIMENT TRAPS, INTO SEDIMENT BASINS OR DITCHES DISCHARGING INTO TRAPS OR BASINS.
  - 2). TEMPORARY SLOPE DRAINS SHALL BE USED AT THE TOP OF FILL SLOPES AS EMBANKMENT IS CONSTRUCTED, TO PREVENT EXCESSIVE EROSION UNTIL SHOULDERS ARE CONSTRUCTED AND THE SLOPES ARE SEEDED AND MULCHED.



- NOTES:**
- 1). THE WORK SHALL CONSIST OF CONSTRUCTING A STILLING WELL FOR THE PURPOSE OF PUMPING CLEAN WATER AROUND A DISTURBED CONSTRUCTION AREA TO A STABILIZED OUTFALL.
  - 2). THE DIMENSIONS OF THE STILLING WELL SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.



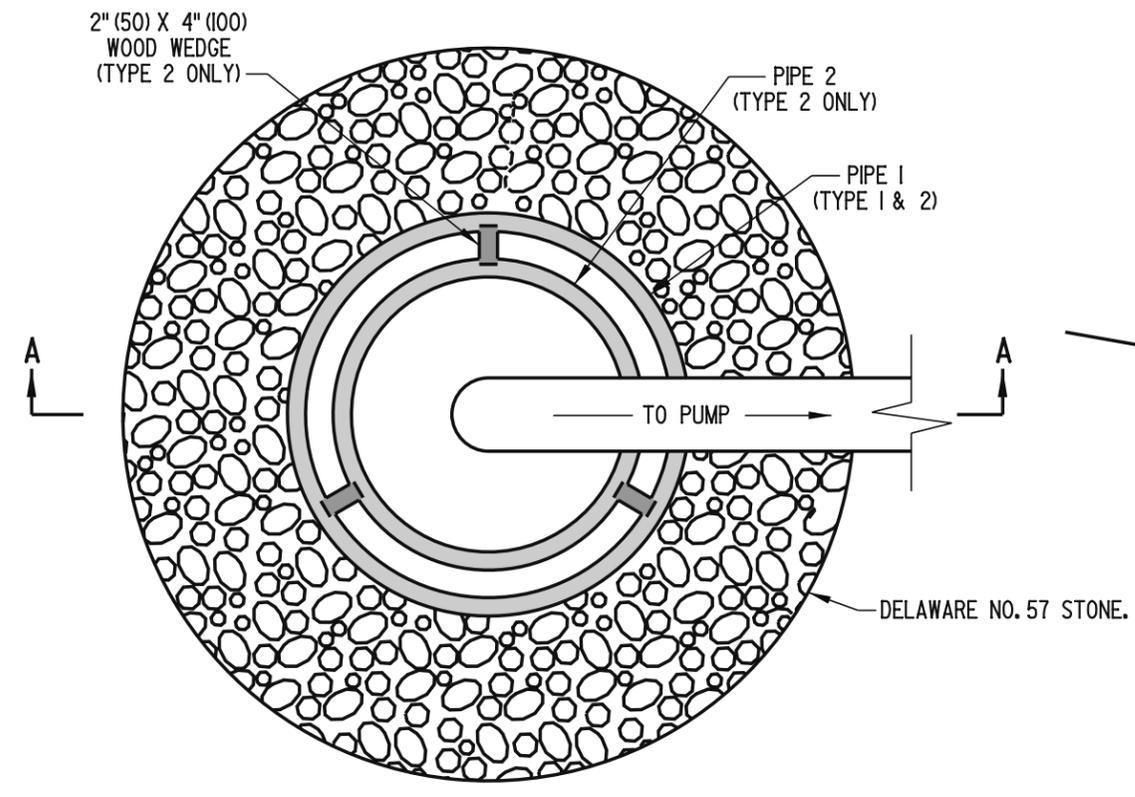
DELAWARE  
DEPARTMENT OF TRANSPORTATION

STILLING WELL

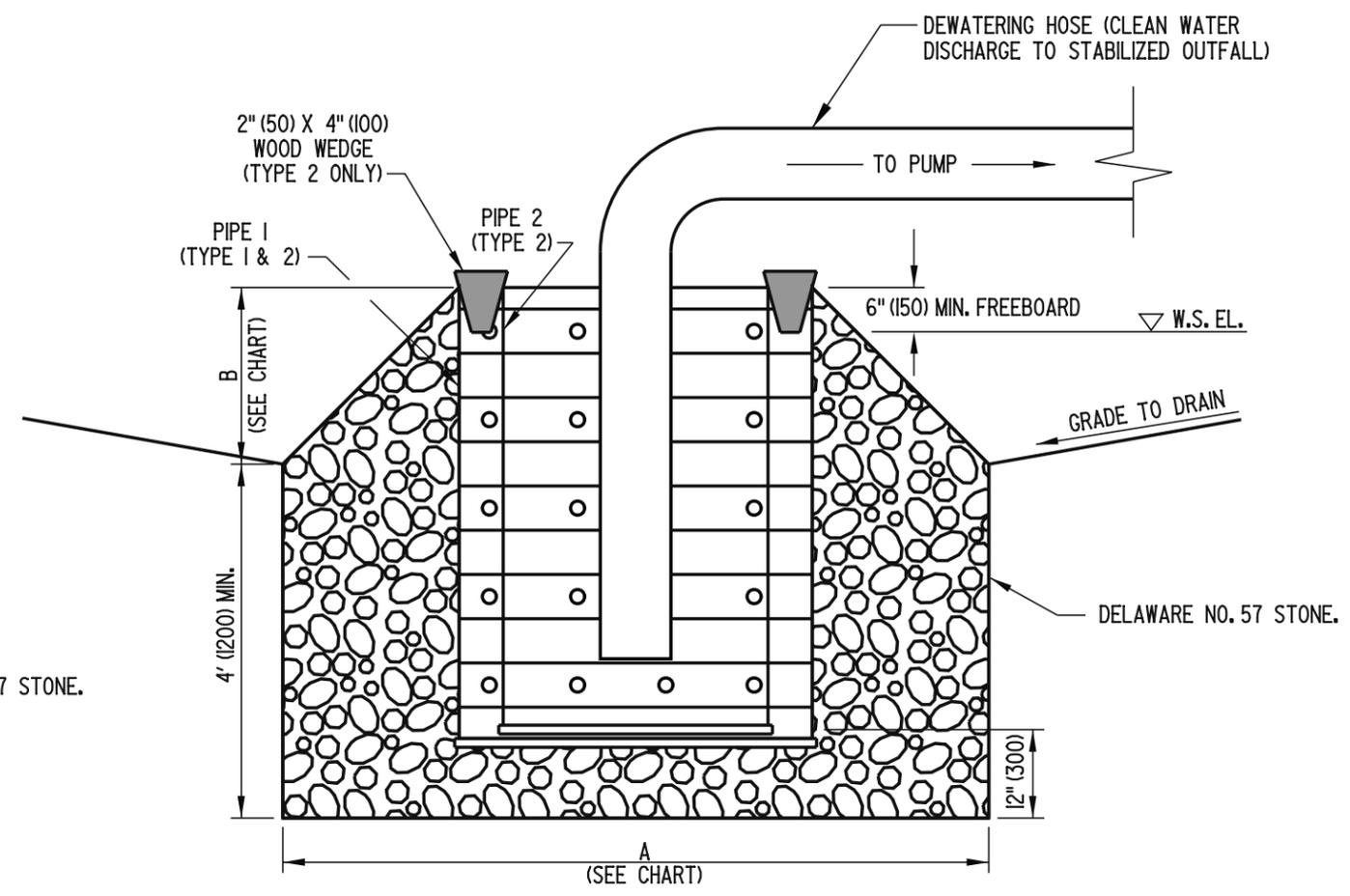
STANDARD NO. E-15 (2005) SHT. 1 OF 1

APPROVED *Carolann Wick* 12/15/05  
CHIEF ENGINEER DATE

RECOMMENDED *James M. O'Brien* 11/29/05  
DESIGN ENGINEER DATE



**PLAN**



**SECTION A-A**

- NOTES:**
- 1). THE WORK SHALL CONSIST OF CONSTRUCTING A SUMP PIT FOR THE PURPOSE OF FILTERING AND PUMPING WATER TO A STABILIZED OUTFALL.
  - 2). GEOTEXTILE FOR THE 36" (900) CMP SHALL BE REPLACED WHEN CLOGGED WITH SEDIMENT.
  - 3). 1/2" x 1/2" (13 x 13) 19 GAGE (I.I) WIRE MESH SHALL BE PLACED AROUND THE REMOVABLE 36" (900) CMP BEFORE ATTACHING THE GEOTEXTILE TO INCREASE FLOW THROUGH THE GEOTEXTILE.
  - 4). ALL PERFORATIONS SHALL BE 1" (25) IN DIAMETER AND 12" (300) ON CENTER IN ALL DIRECTIONS.
  - 5). TYPE I SUMP PIT SHALL BE USED ONLY WHEN PUMPING IS NEEDED FOR LESS THAN 7 DAYS.

| SUMP PIT CHART |   |   |                |           |
|----------------|---|---|----------------|-----------|
| TYPE           | PIPE 1  | PIPE 2  | A              | B         |
| 1              | PERFORATED 24" (600) CMP WITH PERFORATED CAP WELDED ON BOTTOM AND COMPLETELY WRAPPED WITH GEOTEXTILE. | N/A   | 4' (1200) MIN. | 12" (300) |
| 2              | PERFORATED 48" (1200) CMP WITH PERFORATED CAP WELDED ON BOTTOM  | REMOVABLE PERFORATED 36" (900) CMP WITH PERFORATED CAP WELDED ON BOTTOM AND COMPLETELY WRAPPED WITH GEOTEXTILE. | 8' (2400) MIN. | 24" (600) |

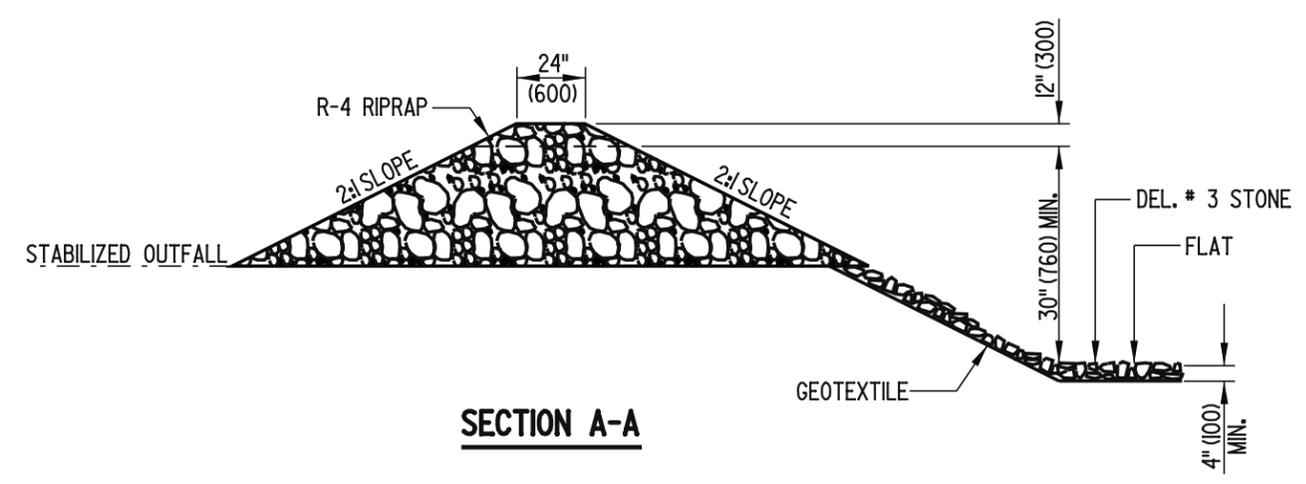
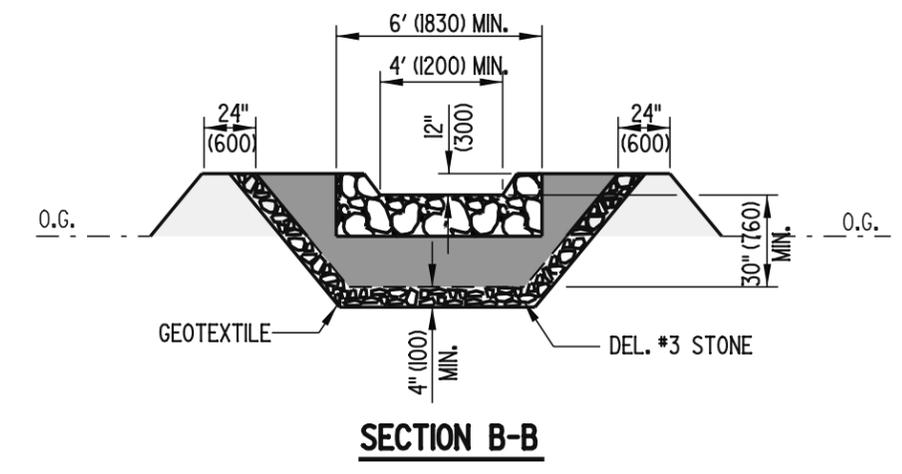
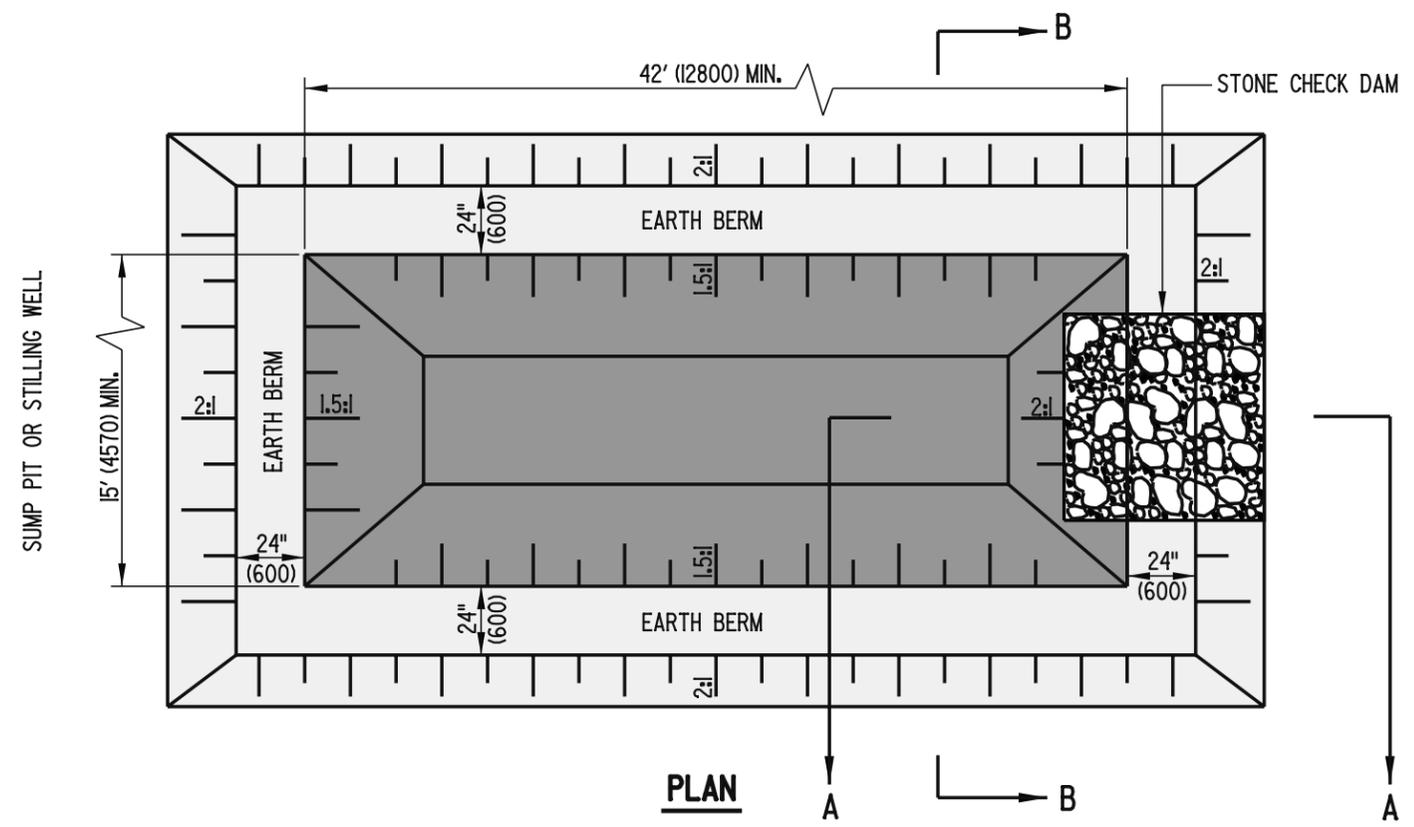


**SUMP PIT, TYPE 1 & 2**

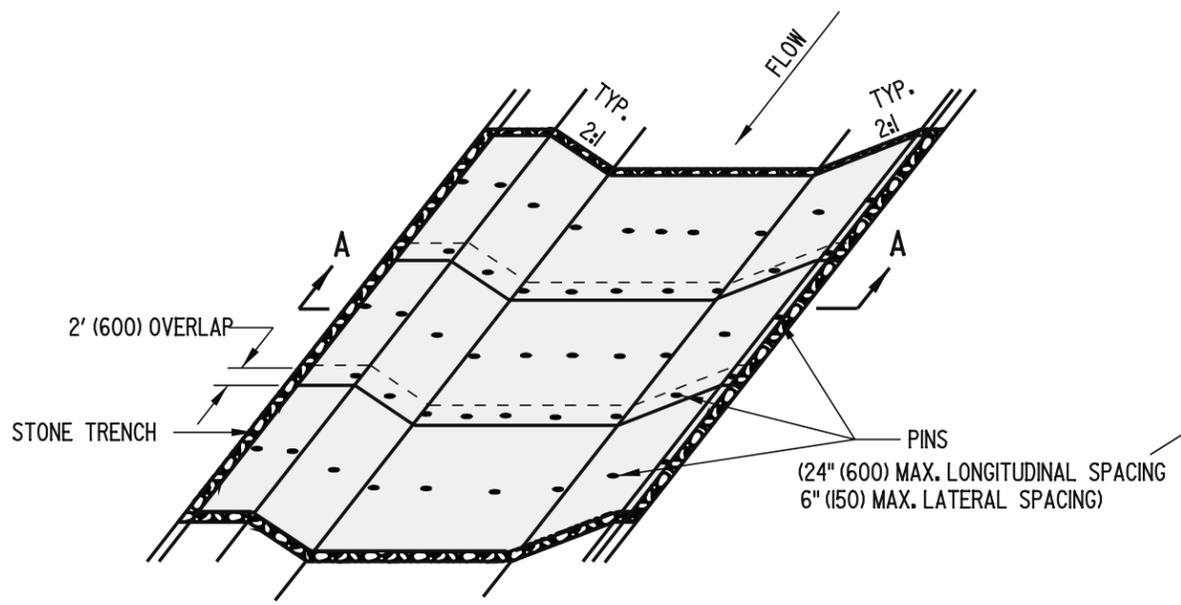
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APPROVED *Carolann Wick* 12/15/05  
CHIEF ENGINEER DATE

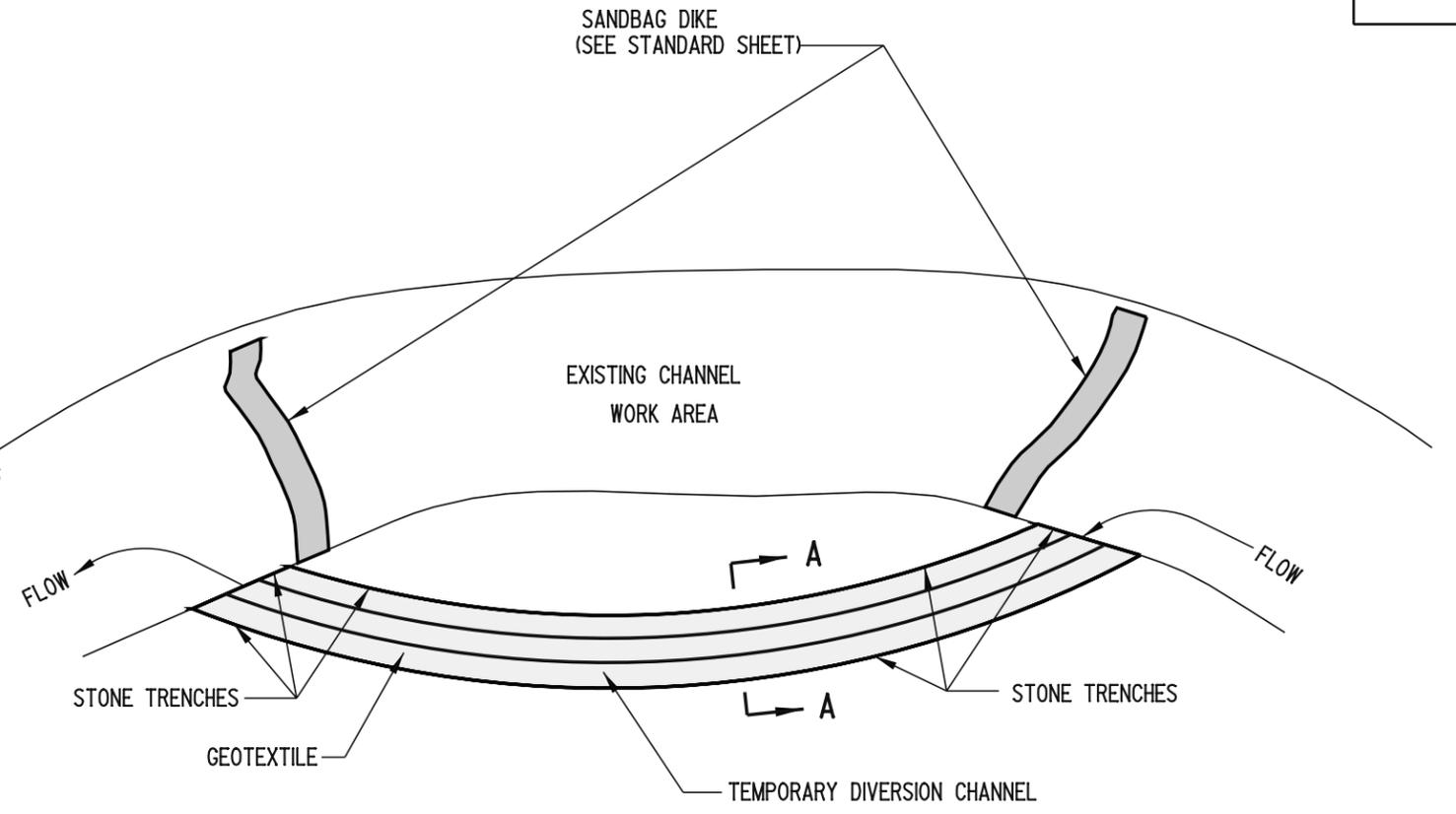
RECOMMENDED *James M. O'Brien* 11/29/05  
DESIGN ENGINEER DATE



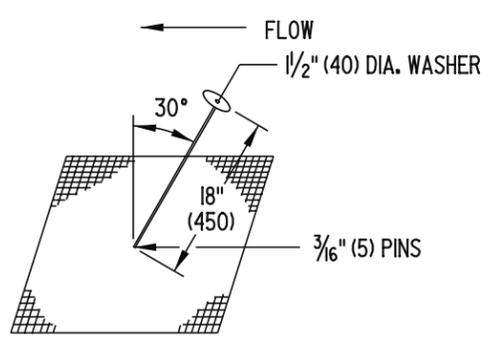
- NOTES:**
- 1.) A DEWATERING BASIN (DWB) IS USED TO REMOVE SEDIMENT FROM SEDIMENT-LADEN WATER PUMPED FROM A CONSTRUCTION SITE BEFORE THE WATER RE-ENTERS THE WATERWAY. THE DWB SHALL HAVE A MINIMUM TOP WIDTH OF 15' (4570) AND A MINIMUM DEPTH OF 3.5' (1065). THE MINIMUM TOP LENGTH SHOWN IN THE PLAN IS USED ONLY FOR QUANTITY CALCULATIONS BY THE ENGINEER. THE ACTUAL TOP LENGTH IN THE FIELD SHALL BE CALCULATED BY THE EQUATION:  
 US CUSTOMARY : TOP LENGTH (FEET) = 26' + .01 x Y  
 METRIC : TOP LENGTH (mm) = 7930 + 48300 x Y  
 WHERE Y IS THE MAXIMUM CAPACITY IN GALLONS PER MINUTE (CUBIC METERS PER SECOND) OF THE DEWATERING PUMP.
  - 2.) THE OUTFALL FROM THE BASIN TO THE RECEIVING WATERS SHALL BE STABILIZED. PUMPING INTO THE DWB SHALL CEASE WHEN THE EFFLUENT FROM THE BASIN BECOMES SEDIMENT-LADEN.
  - 3.) A SUMP PIT OR STILLING WELL (SEE STANDARD SHEETS) SHALL BE USED IN CONJUNCTION WITH A DWB. THE BASIN MAY BE BYPASSED INTO THE STABILIZED OUTFALL IF THE WATER BEING PUMPED IS NON-SEDIMENT-LADEN. DIRECT DISCHARGE TO THE RECEIVING WATERS SHALL CEASE AND BE REDIRECTED TO THE DWB WHEN EFFLUENT FROM THE PUMP BECOMES SEDIMENT-LADEN.
  - 4.) MAINTENANCE MUST BE PERFORMED IN ORDER FOR THE DWB TO FUNCTION PROPERLY. ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED DISPOSAL AREA WHEN THE BASIN IS FILLED TO WITHIN 12" (300) FROM THE CREST.
  - 5.) WHEN USED IN CONJUNCTION WITH A COFFERDAM, DEWATERING SHALL BEGIN NO SOONER THAN 12 HOURS AFTER COFFERDAM INSTALLATION IN ORDER TO ALLOW SEDIMENT PRODUCED DURING INSTALLATION TO SETTLE COMPLETELY.



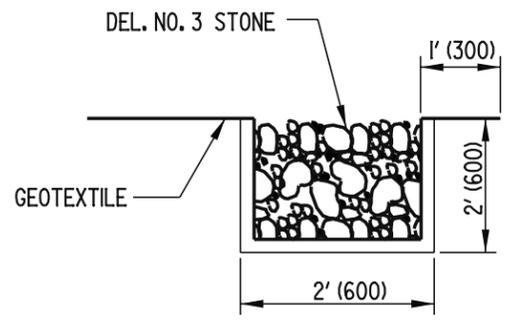
**OBLIQUE VIEW**



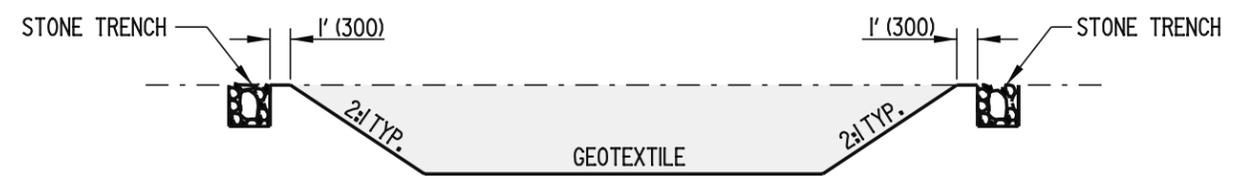
**PLAN**



**FASTENING DETAIL**



**TRENCHING DETAIL**



**SECTION A-A**

NOTE: SEE PLANS FOR LOCATION, DIMENSIONS, GRADES, ETC.

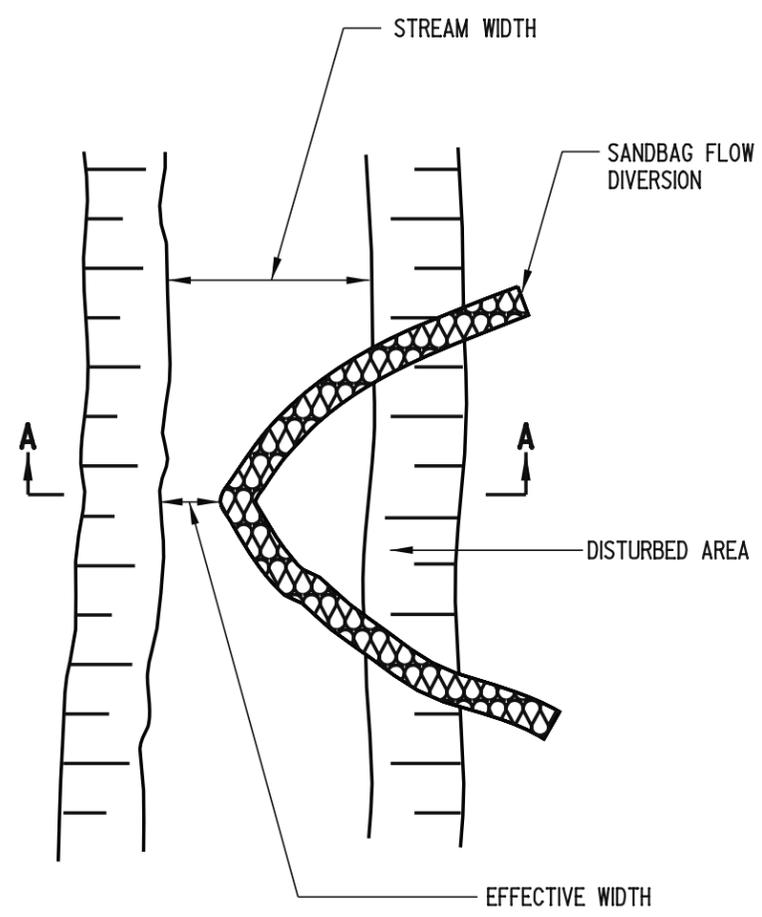


**DELAWARE  
DEPARTMENT OF TRANSPORTATION**

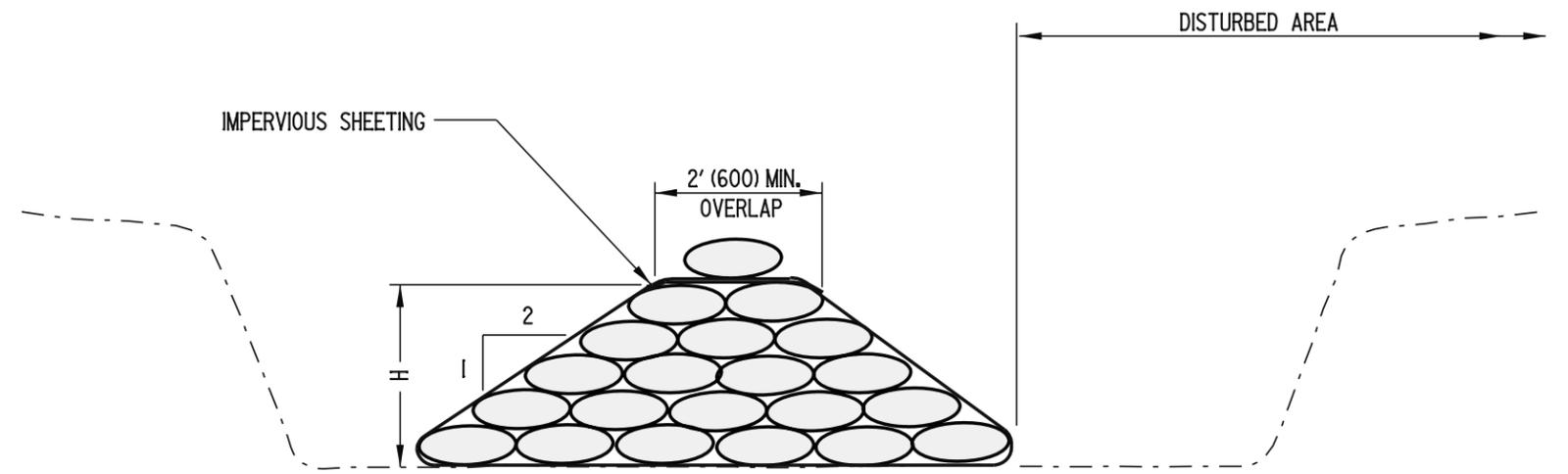
**GEOTEXTILE-LINED CHANNEL DIVERSION**

STANDARD NO. **E-18 (2005)** SHT. **1** OF **1**

APPROVED *Carolann Wick* **12/5/05**  
CHIEF ENGINEER DATE  
 RECOMMENDED *James M. O'Brien* **11/29/05**  
DESIGN ENGINEER DATE

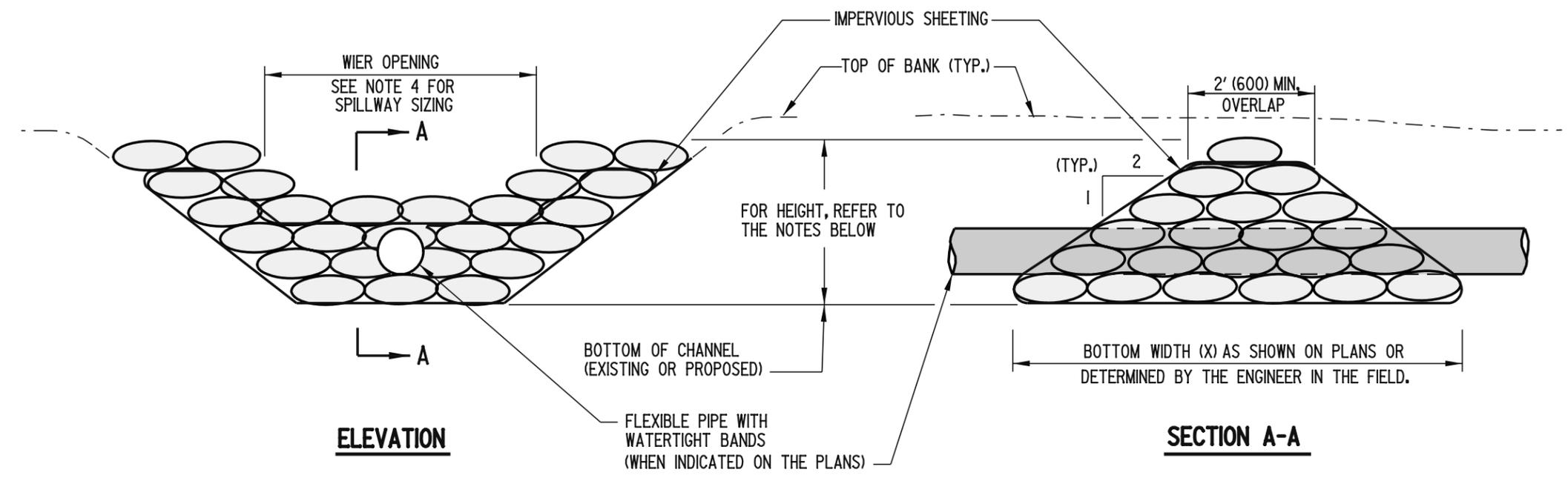


**PLAN**

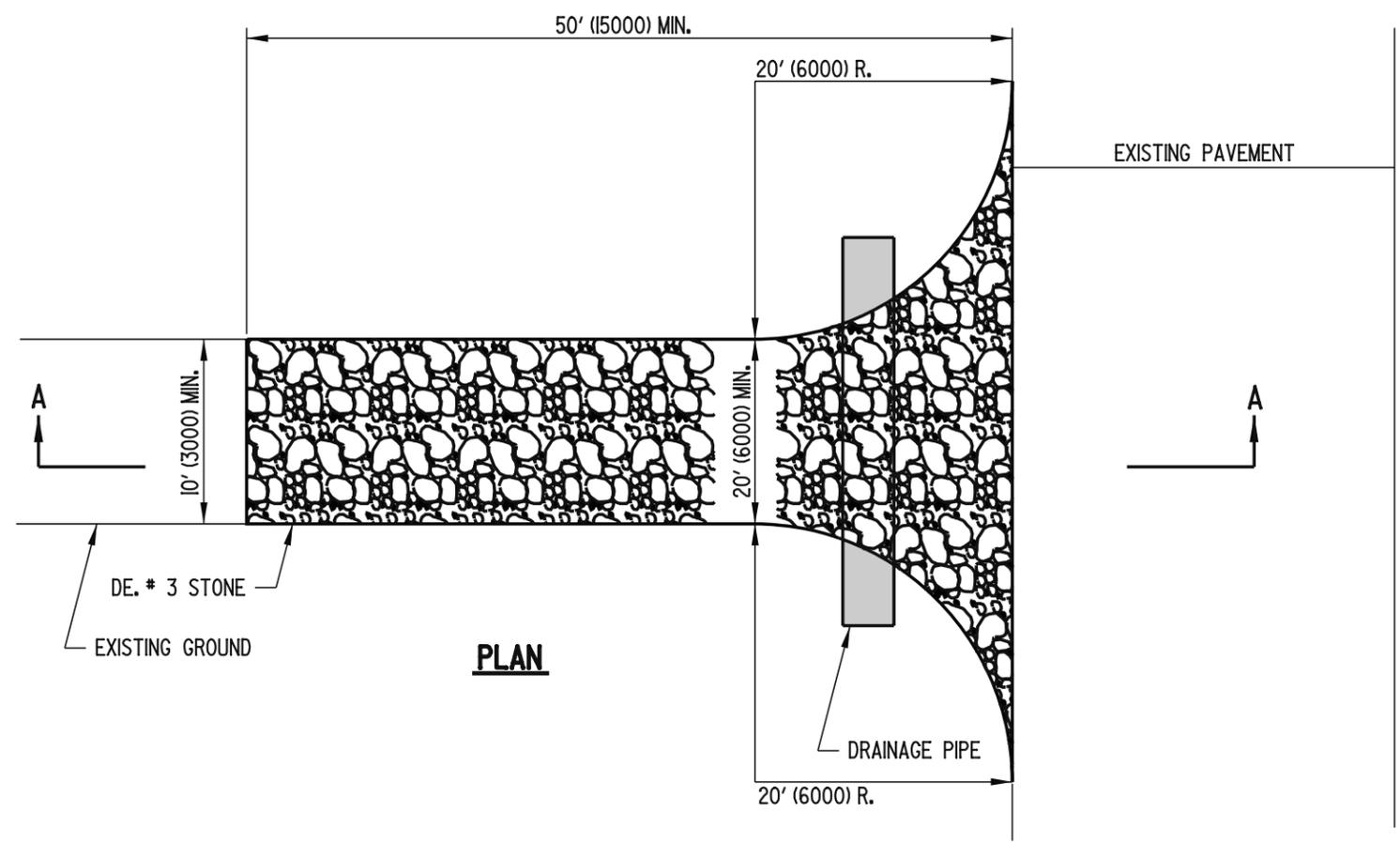


**SECTION A-A**

- NOTES:**
- 1). THE WORK SHALL CONSIST OF INSTALLING FLOW DIVERSIONS FOR THE PURPOSE OF EROSION CONTROL WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS BANK STABILIZATION OR BRIDGE ABUTMENT CONSTRUCTION.
  - 2). THE DIVERSION STRUCTURE SHALL BE INSTALLED FROM UPSTREAM TO DOWNSTREAM.
  - 3). THE EFFECTIVE CHANNEL WIDTH SHALL BE SIZED TO PASS A ONE YEAR STORM EVENT PEAK FLOW, OR 1/3 OF STREAM WIDTH, WHICHEVER IS GREATER.
  - 4). THE SANDBAG DIVERSION HEIGHT (H) SHALL BE 1' (300) ABOVE THE PEAK ELEVATION OF THE ONE YEAR STORM.

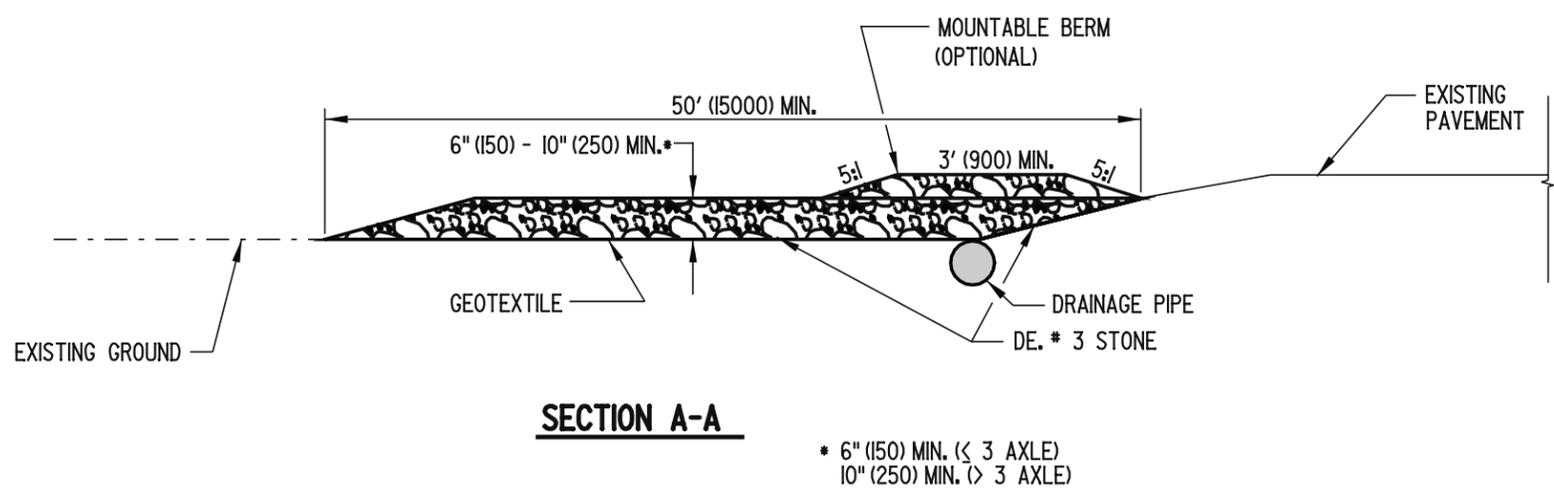


- NOTES:**
- 1). THE WORK SHALL CONSIST OF INSTALLING A SANDBAG DIKE FOR THE PURPOSE OF EROSION CONTROL WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS BANK STABILIZATION OR BRIDGE ABUTMENT CONSTRUCTION.
  - 2). THE SANDBAG DIKE SHALL BE INSTALLED AT THE UPSTREAM LOCATION FIRST.
  - 3). THE HEIGHT OF THE SANDBAG DIKE SHALL BE 1' (300) ABOVE THE PEAK ELEVATION OF THE ONE YEAR STORM, OR EQUAL WITH THE TOP OF BANK, WHICHEVER IS LESS. SEE PLANS FOR INFORMATION.
  - 4). THE SPILLWAY SHALL BE SIZED TO PASS A (1) ONE YEAR STORM EVENT PEAK FLOW, SEE PLANS.
  - 5). THE PIPE, WHEN UTILIZED, SHALL BE SIZED TO PASS THE STREAM BASE FLOW.



**PLAN**

- NOTES:**
- 1). ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED UNDER THE ENTRANCE. IF NECESSARY, A MOUNTABLE BERM WITH 5:1 SLOPES SHALL BE ALLOWED TO FACILITATE PLACEMENT OF PIPES IN SHALLOW CONDITIONS.
  - 2). THE LOCATION AND NUMBER OF STABILIZED CONSTRUCTION ENTRANCES SHALL BE AS INDICATED ON THE PLANS. ANY CHANGE IN LOCATION, ADDITION, OR DELETION OF AN ENTRANCE SHALL BE APPROVED IN ADVANCE BY THE ENGINEER.
  - 3). DRAINAGE PIPE, IF UTILIZED, SHALL BE PAID FOR SEPARATELY UNDER THE APPROPRIATE BID ITEM.
  - 4). THE TOP 2" (50) OF STONE SHALL BE REMOVED AND REPLACED WITH 2" (50) OF CLEAN STONE WHEN VOIDS ARE FILLED OR AS DIRECTED BY THE ENGINEER.



**SECTION A-A**

\* 6" (150) MIN. (< 3 AXLE)  
10" (250) MIN. (> 3 AXLE)



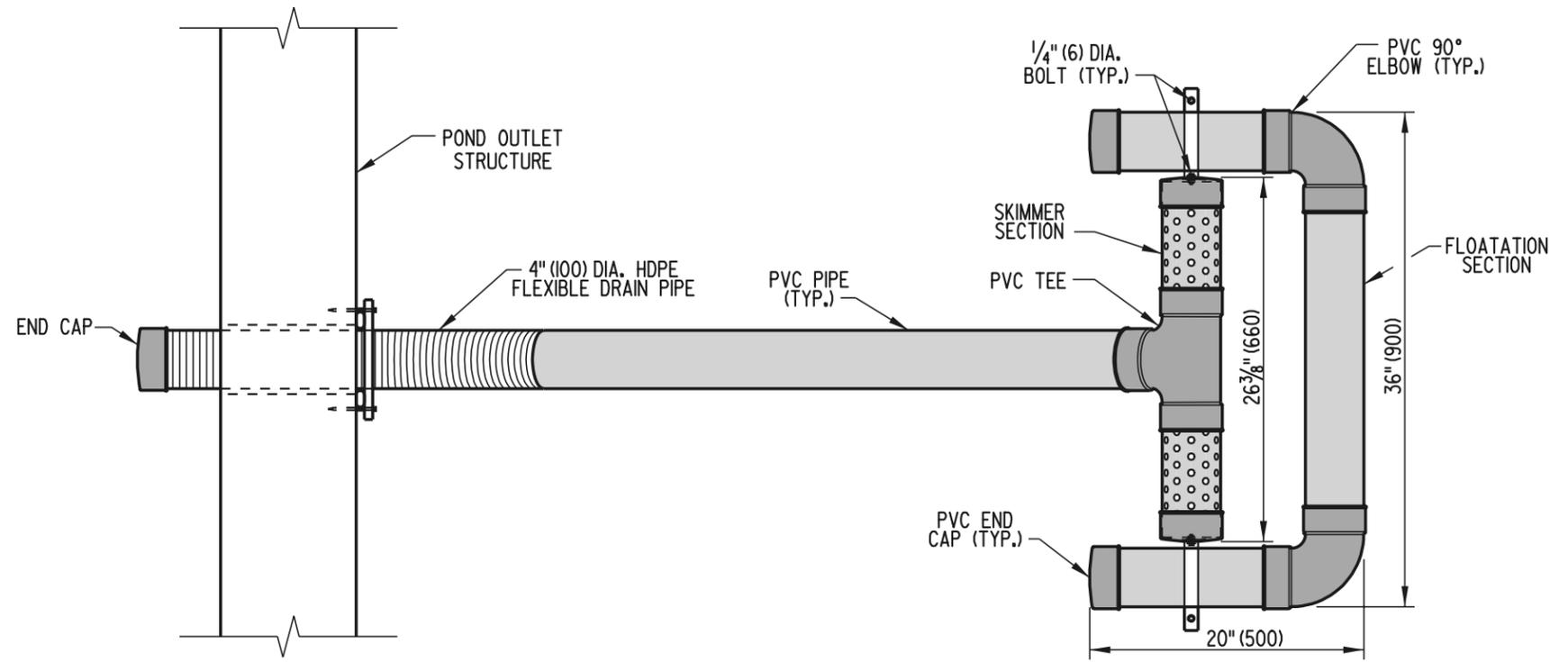
**DELAWARE  
DEPARTMENT OF TRANSPORTATION**

**STABILIZED CONSTRUCTION ENTRANCE**

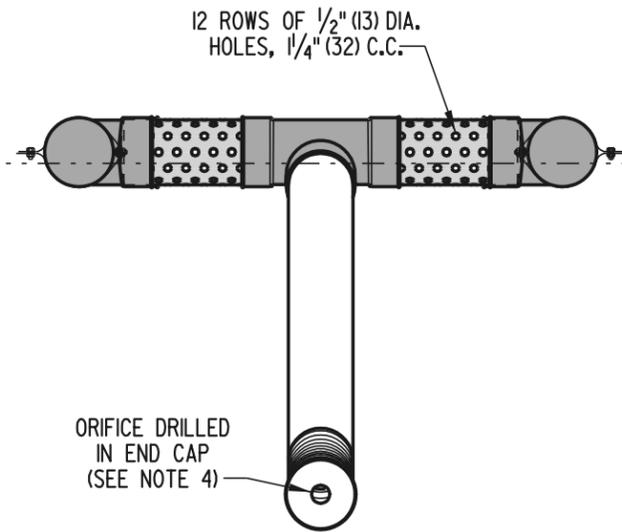
STANDARD NO. **E-21 (2005)** SHT. **1** OF **1**

APPROVED *Carolann Wick* 12/15/05  
CHIEF ENGINEER DATE  
RECOMMENDED *James M. O'Brien* 11/29/05  
DESIGN ENGINEER DATE

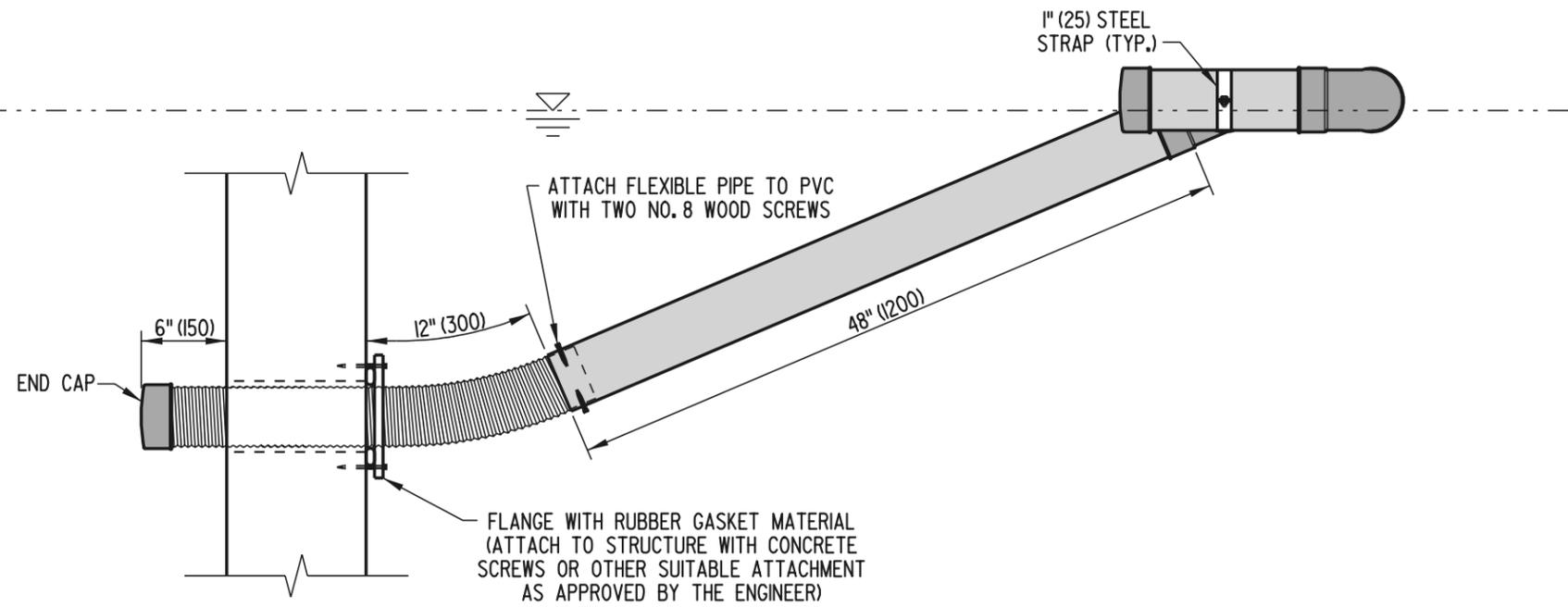
- NOTES:**
- 1). ALL P.V.C. PIPES ARE TO BE 4" (100) I.D., SCHEDULE 40
  - 2). ALL JOINTS OF THE FLOATATION SECTION SHALL BE SOLVENT WELDED. JOINTS OF SKIMMER SECTION NEED NOT BE WATER-TIGHT.
  - 3). 4" (100) HDPE FLEXIBLE DRAIN PIPE IS TO BE ATTACHED TO THE POND OUTLET STRUCTURE WITH WATER-TIGHT CONNECTIONS.
  - 4). ORIFICE IS TO BE SIZED ACCORDING TO STORAGE VOLUME AND TO SLOWLY RELEASE 1" (25) RUNOFF FOR AT LEAST 24-HOURS.



**PLAN VIEW**



**FRONT VIEW**



**SIDE VIEW**

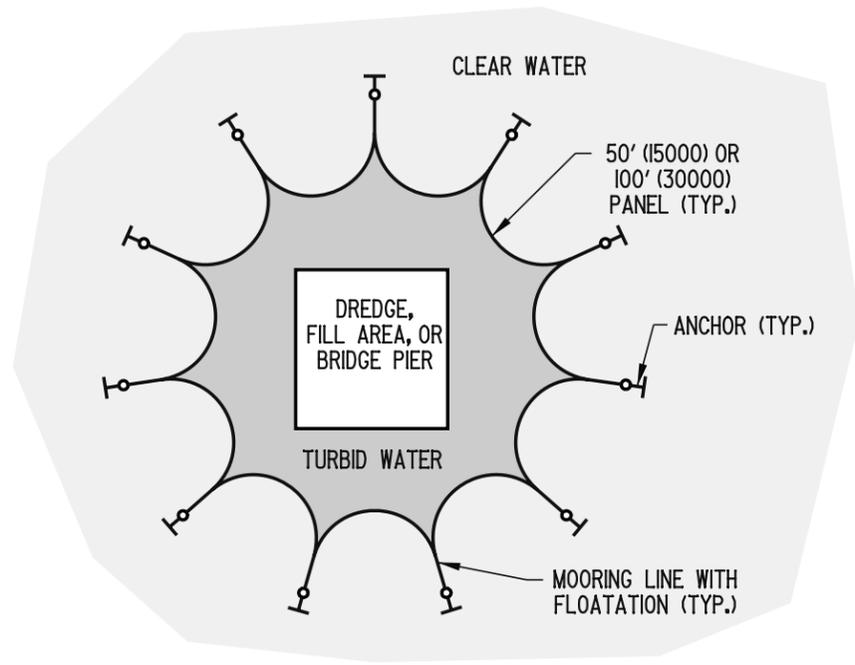


**DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**

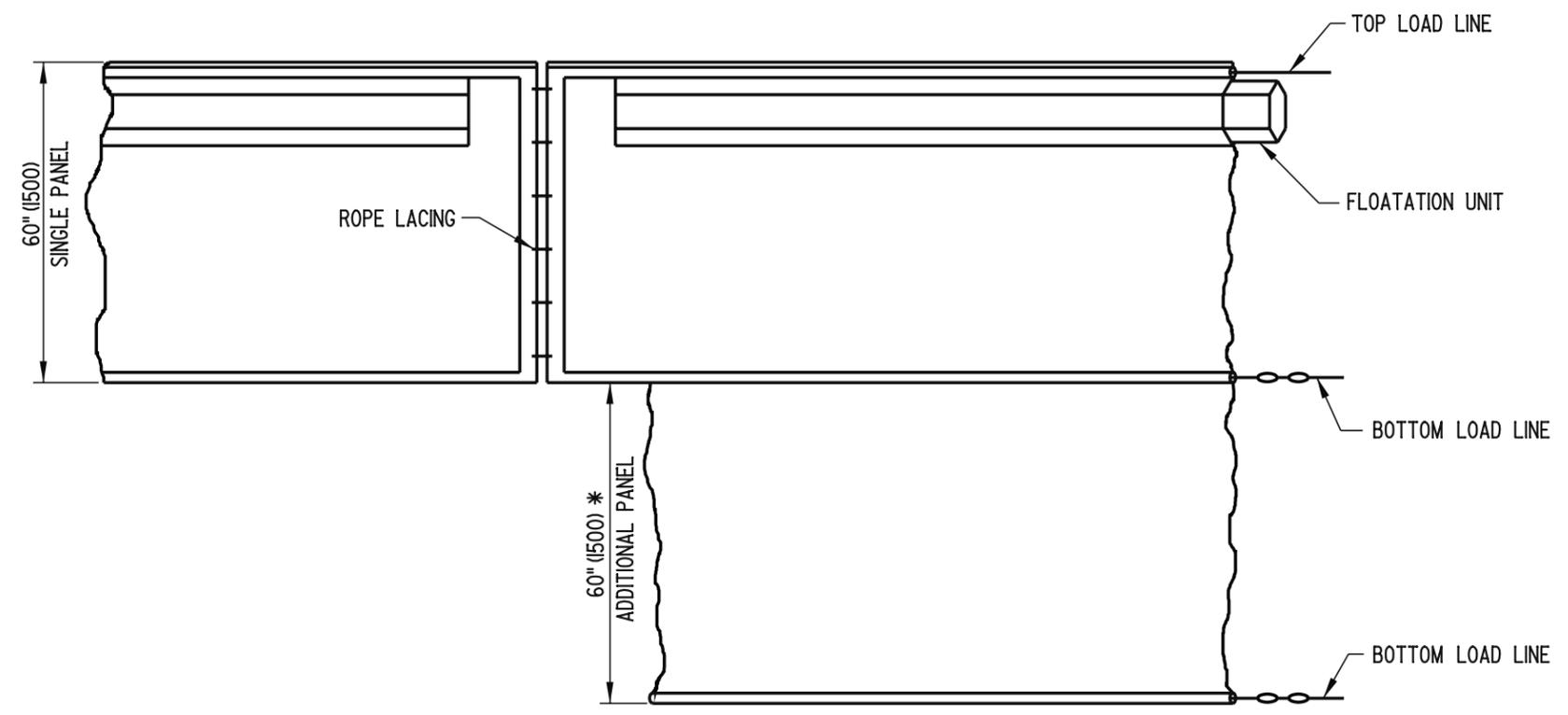
**SKIMMER DEWATERING DEVICE**

STANDARD NO. **E-22 (2001)** SHT. **1** OF **1**

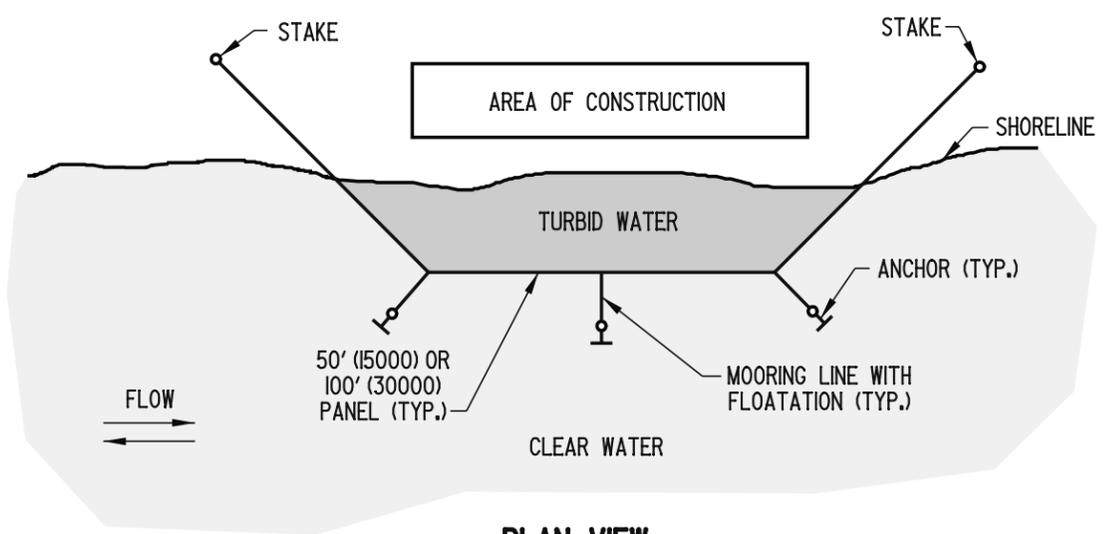
APPROVED *Ryan M. Harkness* 6/18/01  
CHIEF ENGINEER DATE  
 RECOMMENDED *Mehal Alghob* 6/18/01  
DESIGN ENGINEER DATE



**PLAN VIEW**  
OPEN WATER APPLICATION



**ELEVATION**



**PLAN VIEW**  
SHORELINE APPLICATION

**FLOATING TURBIDITY CURTAIN**

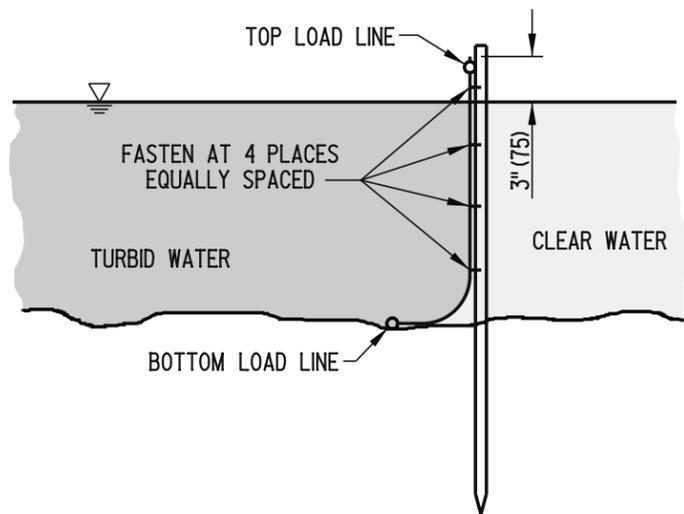
- NOTE:** 1.) ADDITIONAL PANEL REQUIRED FOR DEPTHS GREATER THAN 5' (1500).  
 2.) FLOATING TURBIDITY CURTAIN SHALL REACH BOTTOM UP TO DEPTHS OF 10' (3000) BY USING TWO PANELS. DEPTHS GREATER THAN 10' (3000) SHALL REQUIRE SPECIAL DEPTH CURTAINS SPECIFICALLY CALLED FOR IN THE PLANS OR AS DIRECTED BY THE ENGINEER.



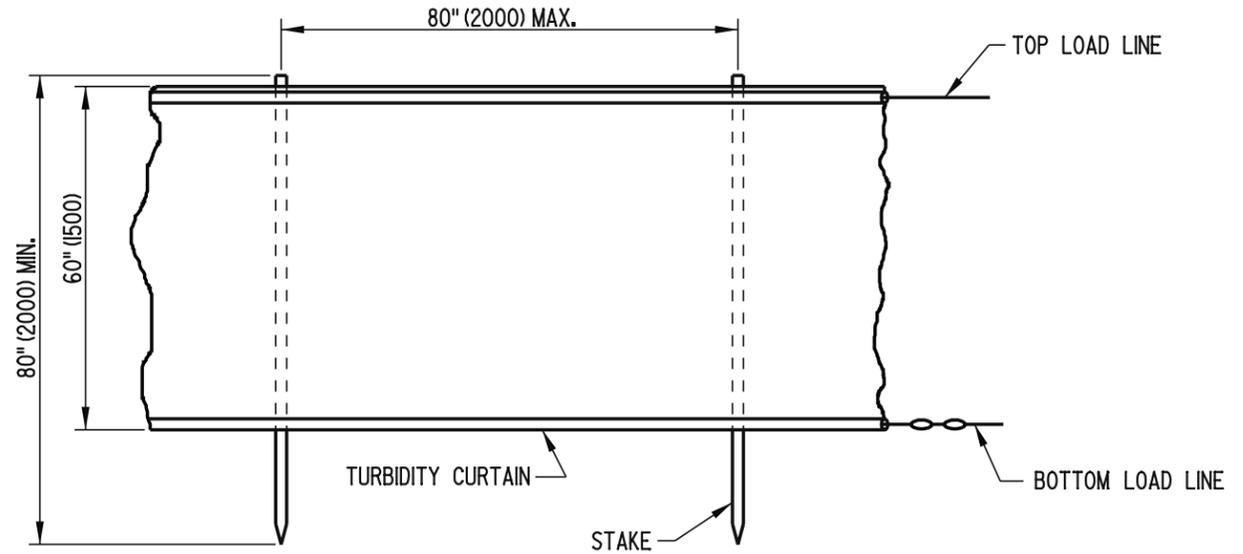
**DELAWARE**  
**DEPARTMENT OF TRANSPORTATION**

|                          |             |      |        |
|--------------------------|-------------|------|--------|
| <b>TURBIDITY CURTAIN</b> |             |      |        |
| STANDARD NO.             | E-23 (2005) | SHT. | 1 OF 2 |

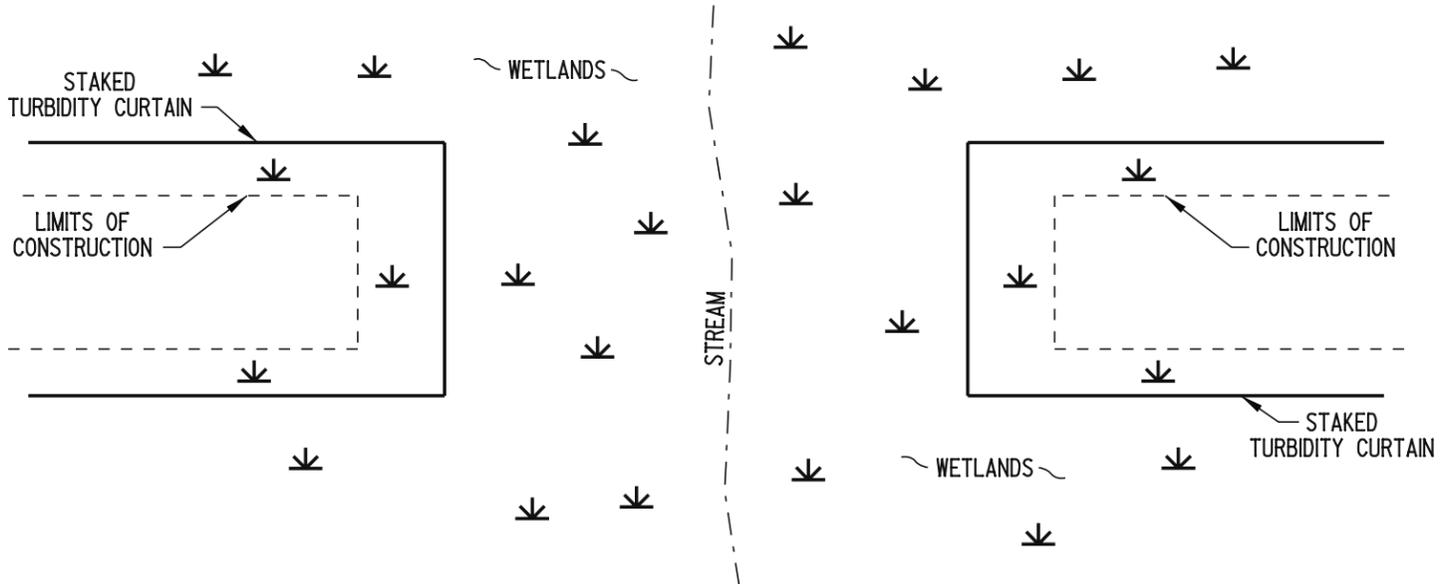
APPROVED *Carolann Wick* 12/5/05  
CHIEF ENGINEER DATE  
 RECOMMENDED *James M. O'Brien* 11/29/05  
DESIGN ENGINEER DATE



**SECTION**

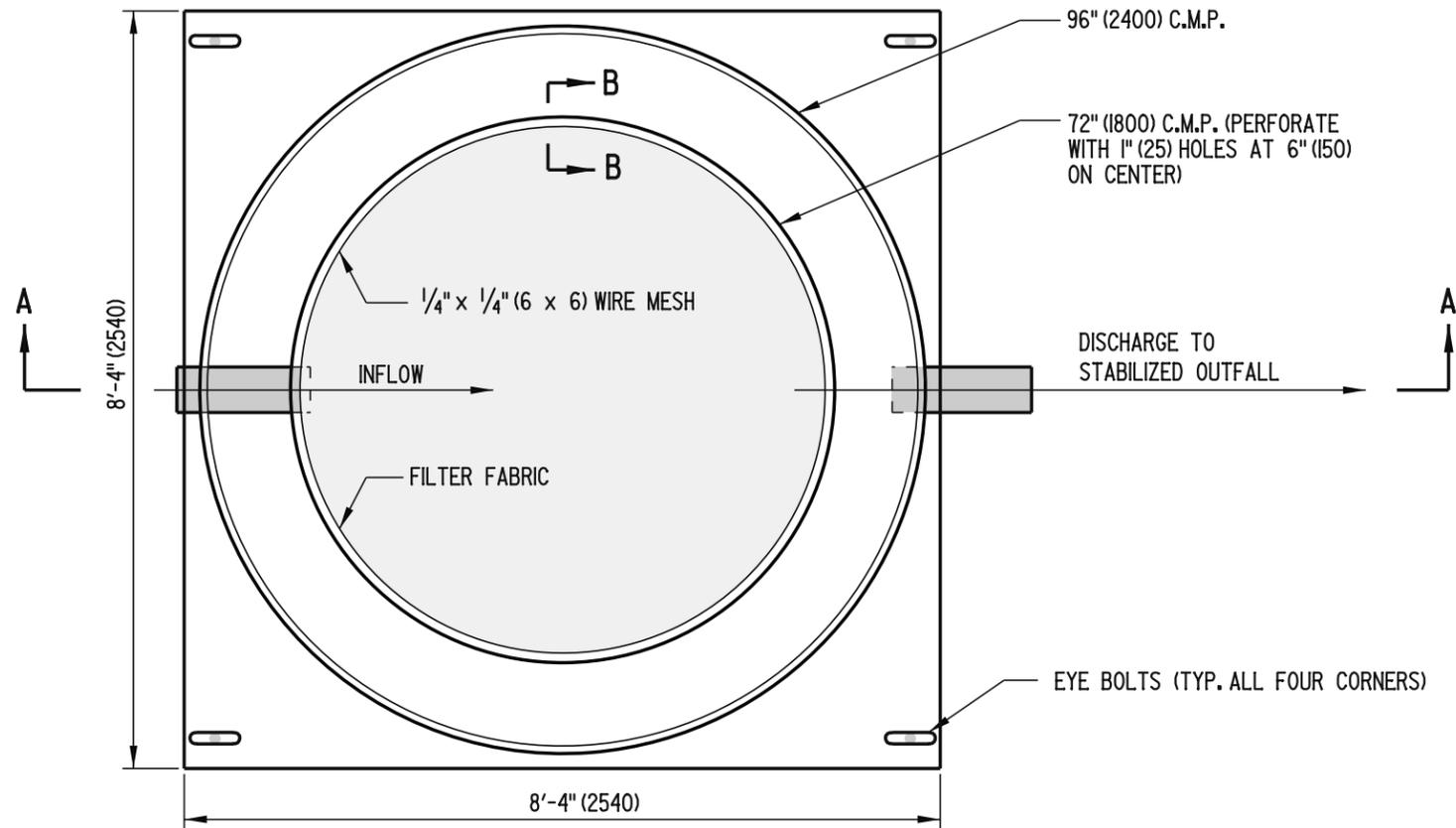


**ELEVATION**



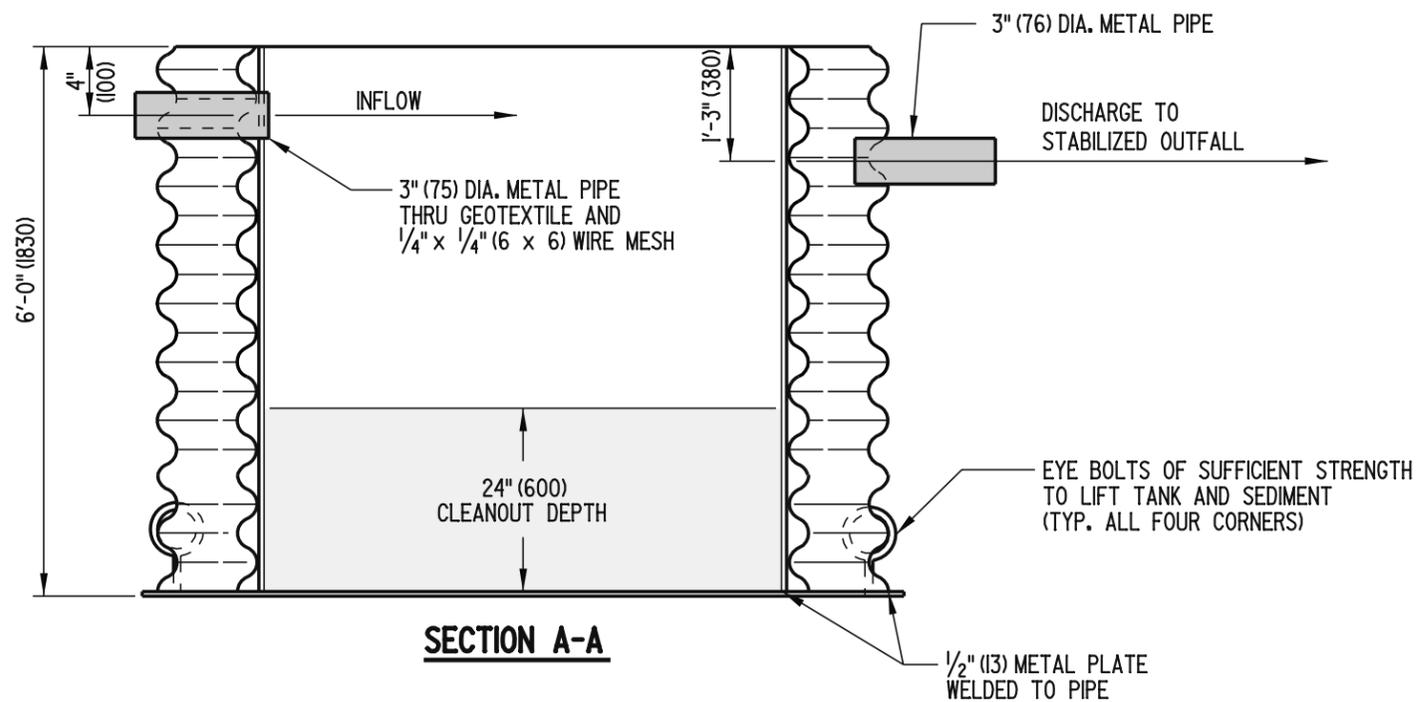
**PLAN VIEW**  
SHALLOW WATER/MARSH APPLICATION

**STAKED TURBIDITY CURTAIN**

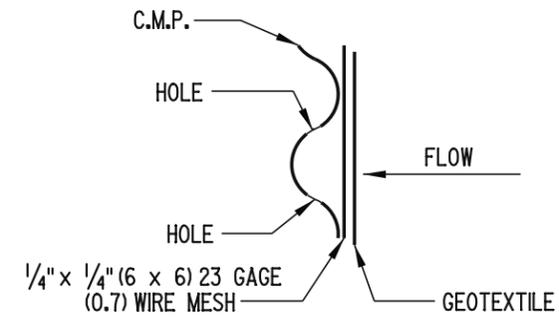


**PLAN**

- NOTES:**
- 1). THE PORTABLE SEDIMENT TANK SHOWN MAY BE USED IN SITES WHERE SPACE IS LIMITED TO CONSTRUCT A DEWATERING BASIN.
  - 2). THE MAXIMUM PUMP DISCHARGE INTO THIS TYPICAL PORTABLE SEDIMENT TANK SHALL BE 425 GALLONS PER MINUTE (26 LITERS PER SECOND). THE FILTER FABRIC SHALL BE REPLACED WHEN THE PORTABLE SEDIMENT TANK CAN NO LONGER ALLOW THIS FLOW RATE, WHEN THERE IS A TEAR, OR WHEN DIRECTED BY THE ENGINEER.
  - 3). SEVERAL UN-CONNECTED OR CONNECTED IN PARALLEL PORTABLE SEDIMENT TANKS MAY BE USED WHEN A HIGHER FLOW RATE IS NEEDED TO DE-WATER THE JOB.
  - 4). OTHER DESIGNS MAY BE USED PROVIDED THE HYDRAULIC DESIGN IS SUBMITTED TO AND APPROVED BY THE STORMWATER ENGINEER.



**SECTION A-A**



**SECTION B-B**

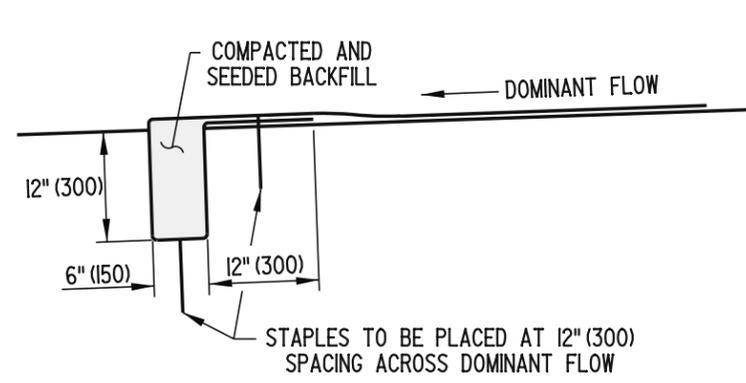


DELAWARE  
DEPARTMENT OF TRANSPORTATION

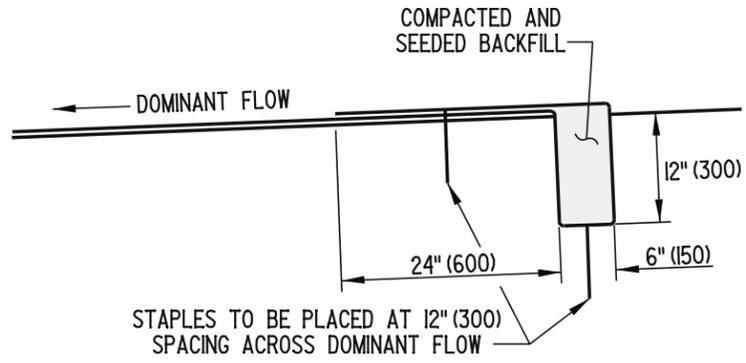
PORTABLE SEDIMENT TANK

STANDARD NO. E-24 (2005) SHT. 1 OF 1

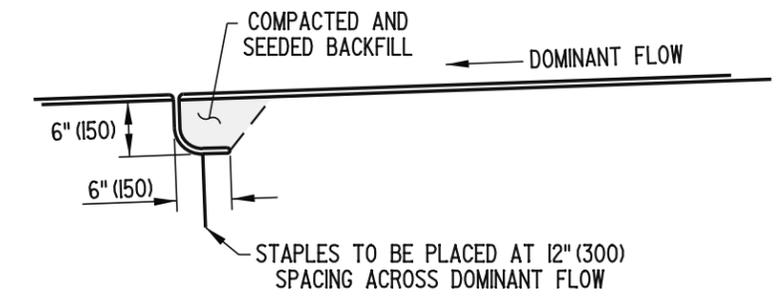
APPROVED *Carolann Wick* 12/15/05  
CHIEF ENGINEER DATE  
RECOMMENDED *James M. O'Brien* 11/29/05  
DESIGN ENGINEER DATE



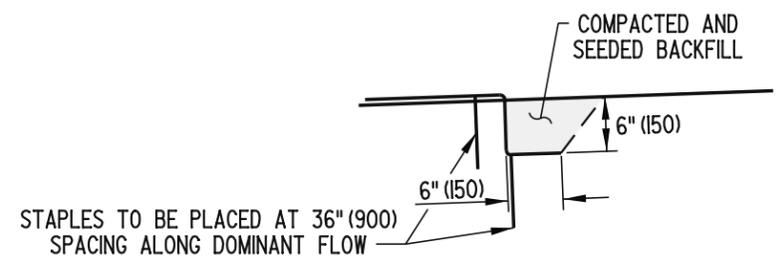
**INITIAL TRENCH ANCHOR DETAIL**  
APPLIED AT THE DOWNSTREAM END OF DITCH



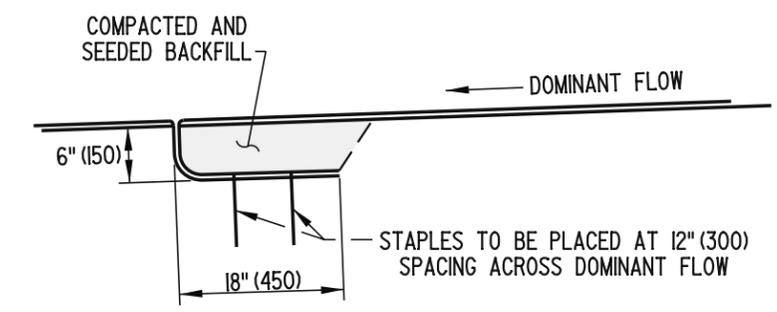
**TERMINAL TRENCH ANCHOR DETAIL**  
APPLIED AT THE UPSTREAM END OF DITCH



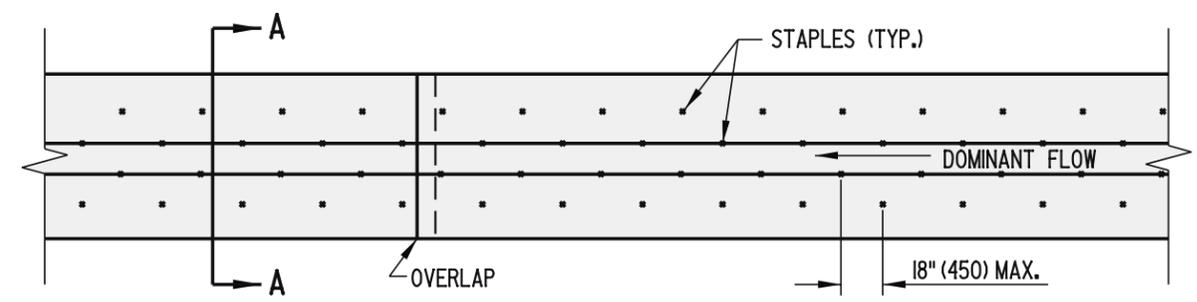
**CHECK SLOT DETAIL**  
(AS NEEDED PER PLANS)



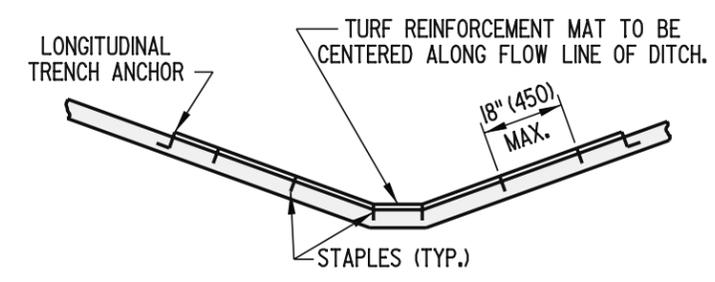
**LONGITUDINAL TRENCH ANCHOR DETAIL**



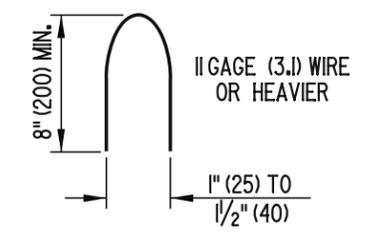
**OVERLAP DETAIL**



**STABILIZATION OF DITCHES PLAN**



**STABILIZATION OF DITCHES SECTION A-A**



**STAPLE DETAIL**

- NOTES:**
1. ADDITIONAL STAPLES NOT SHOWN ARE REQUIRED AT OVERLAPS, ENDS, CHECK SLOTS AND EDGES. SEE APPROPRIATE DETAILS FOR STAPLE PLACEMENT.
  2. STAPLES ARE TO BE STAGGERED.
  3. TOPSOIL UNDER TURF REINFORCEMENT MAT IS TO BE TRACKED AND SEEDED.

